A2 Level Microeconomics Notes
Book-3

2017 – 19 Edition

Imran Latif

M.A. Economics, M.A. Mass Communication

VISITING TEACHER AT:

Green Hall Academy (GHA)

Lahore Grammar School (LGS)

Salamat School System (SICAS)

Beaconhouse School System (BSS)

Keynesian Institute of Management Sciences (KIMS)

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	Cell: +923004410900
	Email: imranlatifmalik@gmail.com
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Preface

The idea of writing notes for Cambridge A-level Economics came to me in 2003, when, having already taught for a year, I realized that no single economics book available in the local and international markets covered all the topics with the depth and perspective required by the CIE syllabus. Both students and teachers had to consult 3 to 4 different books to find all the material that they needed—private candidates and new teachers had it even worse. Furthermore, it was really difficult for students to keep having to refer through different books when the exams were close and they were starved for time. I took on the challenge and decided to write a comprehensive text that explicitly followed the syllabus and exam pattern of the CIE. A year and a half later, in the middle of 2004, I had finally written and published four entire volumes of A-level economics notes. Part of them had been hand-written, and part of them had been typed. Soon, word of their usefulness spread, and they were bought all over Pakistan.

The notes had served their purpose well till the end of 2014. Till that point, there had only been minor changes in the syllabus. But now, there was a dire need to update them, for the new syllabus for the 2016 examination introduced some significant changes in course content.

In this new and improved edition, old topics have been revised and new topics have been added. At the end of each topic, a relevant list of essay questions has been added as well, and these contain questions spanning from 1990 to 2015. These questions provide a clear guideline regarding how the examiners assess students' knowledge on the topics for Paper 2 and Paper 4, allowing the student to practice effectively. While writing these notes I kept in mind the way in which the examiner tests MCQs as well. The notes have been divided into four volumes to make it easier for those who are following the AS and A2 track separately and for those who are taking the composite exam; the syllabus division in the following pages has been provided for this express purpose.

I hope my efforts will help to contribute both to the learning of the student, as well as to the inquisitiveness of any teachers of A-level economics, effectively. Your suggestions will help me improve the quality of the content for later editions and will be highly appreciated.

Imran Latif

Cell: 0092-300-44-10-900

Email: imranlatifmalik@gmail.com

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A-Level Economics 9708 Syllabus overview (2016-18)

AS Level		A2 Level	
Microeconomics	**Macroeconomics**	**Microeconomics**	**Macroeconomics**
Book 1	**Book 2**	**Book 3**	**Book 4**
a. Basic economic ideas and resource allocation b. Demand and supply and equilibrium c. Elasticity of demand and supply d. Government microeconomic intervention	1. Aggregate Demand (AD) and Aggregate Supply (AS) 2. Money and inflation 3. International trade 4. Exchange rate 5. Balance of payments 6. Government macro intervention (Macroeconomic policies)	1. Theory of consumer behaviour 2. Production and cost 3. Rules of firms behaviour 4. Perfect competition 5. Monopoly 6. Monopolistic competition 7. Oligopoly(kinked demand curve, game theory, price leadership and cartel) 8. comparisons of market structures 9. Objectives of a firm, Price discrimination, Contestable markets 10. Efficiency , equity and market failure 11. Labour market	1. National Income statistics 2. Economic growth and development 3. Keynesian theory of income and employment in 2, 3 and 4-sector economies 4. Money, banking and interest rate determination 5. Monetary and development policies 6. Employment/unemployment 7. Macroeconomic objectives and conflicts between the policy objectives 8. Keynesian and Monetarist schools

A-Level Economics 9708 Syllabus Contents Details (2016-18)

Book 1 (AS Level Microeconomics)

UNIT 1: BASIC ECONOMIC IDEAS AND RESOURCE ALLOCATION

a. Scarcity, choice and opportunity cost
- the fundamental economic problem
- the meaning of scarcity and the inevitability of choices at all levels (individual, firms, governments)
- the basic questions of what will be produced, how and for whom
- the margin and decision making at the margin

b. Positive and normative statements
- the distinction between facts and value judgements

c. Factors of production
- the rewards to the factors of production: land, labour, capital and enterprise
- specialisation and division of labour (Transferred to Book 2 unit 2)

d. Resource allocation in different economic systems and issues of transition
- decision making in market, planned and mixed economies
- the role of the factor enterprise in a modern economy

e. Production possibility curves
- shape and shifts of the curve
- constant and increasing opportunity costs

f. Classification of goods and services
- free goods, private goods (economic goods) and public goods
- merit goods and demerit goods as the outcome of imperfect information by consumers.

g. Money (Transferred to book 2 unit 2)
- functions and characteristics in a modern economy
  barter, cash and bank deposits, cheques, near money, liquidity

UNIT 2: DEMAND, SUPPLY AND EQUILIBRIUM

a. Demand and supply curves
- effective demand
- the meaning of the term, '*ceteris paribus*'
- individual and market demand and supply
- factors influencing demand and supply

b. Interaction of demand and supply

c. Market equilibrium and disequilibrium
- meaning of equilibrium and disequilibrium
- effects of changes in supply and demand on equilibrium price and quantity
- applications of demand and supply analysis
- movements along and shifts of the demand and supply curves
- joint demand (complements) and alternative demand (substitutes)
- joint supply
- the workings of the price mechanism; rationing, signalling and the transmission of preferences

UNIT 3: ELASITICITY OF DEMAND AND SUPPLY

a. Price elasticity, income elasticity and cross-elasticities of demand
- the meaning and calculation of elasticity of demand
- the range of elasticities of demand
- the factors affecting elasticity of demand
- the implications for revenue and business decisions of price, income and cross-elasticities of demand

b. **Price elasticity of supply**
- meaning and calculation of elasticity of supply
- the range of elasticities of supply
- the factors affecting elasticity of supply
- implications for speed and ease with which businesses react to changed market conditions short run, long run, very long run

UNIT 4: GOVERNMENT MICRO INTERVENTION

a. Consumer and producer surplus
- meaning and significance
- how these are affected by changes in equilibrium price and quantity

b. Government microeconomic intervention
- Taxes (direct and indirect)
- Subsidies
- Maximum and minimum prices
- Transfer payments (transferred to Book 2 unit 1)
- Direct provision of goods and services
- Nationalisation and privatization

Book 2 (AS Level Macroeconomics)

UNIT 1: AGGREGATE DEMAND (AD) AND AGGREGATE SUPPLY (AS):
- the shape and determinants of AD and AS Curves
- AD = C + I + G + (X – M)
- the distinction between a movement along and a shift in AD and AS
- the interaction of AD and AS and the determination of the level of output, prices and employment

UNIT 2: MONEY AND INFLATION:

a. Money
- functions and characteristics in a modern economy
- barter, cash and bank deposits, cheques, near money, liquidity

b. Inflation
- the definition of inflation
- degrees of inflation
- deflation and disinflation
- measurement of inflation
- the distinction between money values and real data (shifted to Book 2 Unit 1)
- the causes of inflation (cost-push and demand-pull inflation)
- the consequences of inflation

c. Specialisation and division of labour

UNIT 3: INTERNATIONAL TRADE:

a. The terms of trade
- the measurement of the terms of trade
- causes of changes in the terms of trade
- the impact of changes in the terms of trade

b. Principles of absolute and comparative advantage
- the distinction between absolute and comparative advantage
- free trade area, customs union, monetary union, full economic union
- trade creation and trade diversion
- the benefits of free trade, including the trading possibility curve

c. Protectionism
- the meaning of protectionism in the context of international trade
- different methods of protection and their impact, for example, tariffs, import duties and quotas, export subsidies, embargoes, voluntary export restraints (VERs) and excessive administrative burdens (‘red-tape’)
- the arguments in favour of protectionism

UNIT 3: EXCHANGE RATE:

a. Exchange rates
- definitions and measurement of exchange rates
- nominal, real, trade-weighted exchange rates

b. Exchange rate systems
- the determination of exchange rates floating, fixed, managed float

c. Changes and effects
- the factors underlying changes in exchange rates
- the effects of changing exchange rates on the
- domestic and external economy using AD, Marshall-Lerner and J curve analysis
- depreciation/appreciation
- devaluation/revaluation

UNIT 4: BALANCE OF PAYMENTS:

a. BOP accounts
- the components of the balance of payments
- accounts (using the IMF/OECD definition)
- current account
- capital account
- financial account
- balancing item

b. BOP equilibrium and disequilibrium
- meaning of balance of payments equilibrium and disequilibrium
- causes of balance of payments disequilibrium in each component of the accounts
- consequences of balance of payments disequilibrium on domestic and external economy

UNIT 5: GOVERNMENT MACRO INTERVENTION:

a. Types of policy
- fiscal policy
- monetary policy,
- supply side policy
  (instruments of each policy)

b. Policies to correct balance of payments disequilibrium
- assessment of the effectiveness of fiscal, monetary and supply side policies to correct a balance of payments disequilibrium
  (expenditure-reducing an expenditure-switching)

c. Policies to correct inflation and deflation
- assessment of the effectiveness of fiscal,
- monetary and supply side policies to correct inflation and deflation

Book 3 (A2 Level Microeconomics)

UNIT 1: THEORY OF CONSUMER BEHAVIOUR:

a. Law of diminishing marginal utility

- Law of diminishing marginal utility
- its relationship to derivation of an individual demand schedule

b. Equi-marginal principle

- Equi-marginal principle
- limitations of marginal utility theory
- rational behaviour versus behavioural economic models

c. Indifference curves and budget lines
- income, substitution and price effects for various types of goods

UNIT 2: PRODUCTION AND COST:

a. Short-run production function:
- fixed and variable factors of production
- total product, average product and marginal product
- law of diminishing returns (law of variable proportions)
- marginal cost and average cost
- short-run cost function – fixed costs versus variable costs
- explanation of shape of Short-Run Average Cost (SRAC)

b. Long-run production function
- returns to scale
- long-run cost function
- explanation of shape of Long-Run Average Cost (LRAC)
- relationship between economies of scale and decreasing costs
- internal and external economies of scale and diseconomies of scale

UNIT 3: RULES OF FIRMS BEHAVIOUR:

a. Revenue:
- total, average and marginal

b. Short-run and long-run continuity
- exit of firms in long-run
- shutdown in short-run

c. Profit:
- normal and abnormal (supernormal)
- total, marginal and average profits
- traditional profit maximising objective of firm

UNIT 4: PERFECT COMPETITION:

a. Features
- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:
- total, average and marginal revenue

c. Short-run price and output determination
- normal, abnormal and subnormal profits
- types of losses and shutdown in short-run
- short-run supply curve of a firm

d. Long-run price and output determination:
- abnormal to normal profits
- losses to normal profits

UNIT 5: MONOPOLY:

a. Features
- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:
- total, average and marginal revenue
- relation between elasticity and revenue

c. Short-run price and output determination
- normal, abnormal and subnormal profits
- types of losses and shutdown in short-run

d. Long-run price and output determination:
- barriers to entry
- natural monopoly

UNIT 6: MONOPOLISTIC COMPETITION:

a. Features
- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:
- total, average and marginal revenue

c. Short-run price and output determination
- normal, abnormal and subnormal profits
- types of losses and shutdown in short-run

d. Long-run price and output determination:
- abnormal to normal profits
- losses to normal profits

UNIT 7: OLIGOPOLY:

a. Features
- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:
- total, average and marginal revenue

c. Price and output determination
- non-collusive models (kinked demand curve and game theory, mutual interdependence, Prisoner's Dilemma, 2 player Pay-off Matrix)
- collusive models of price leadership and cartel

d. Growth and survival of firms
- reasons for small firms
- integration, diversification, mergers,

UNIT 8: COMPARISON OF MARKET STRUCTURES:

a. Comparisons of performance of firms:
- revenue
- output
- profits
- efficiency
- X-inefficiency
- barriers to entry and exit
- price competition
- non-price competition collusion

UNIT 9: FIRM'S OBJECTIVES, PRICE DISCRIMINATION AND CONTESTABLE MARKETS:

a. Differing objectives of a firm:
- traditional profit maximising objective
- principal agent problem, for example the divorce of ownership from control
- sales maximization
- survival, strategic
- satisficing

b. Price discrimination:
- meaning
- types
- conditions
- operations
- advantages and disadvantages

c. Contestable markets:
- meaning
- examples
- perfectly contestable markets
- limit pricing

UNIT 10: EFFICIENCY AND MARKET FAILURE:

a. Efficient resource allocation
- productive efficiency
- allocative efficiency
- Pareto optimality
- dynamic efficiency

b. Externalities and market failure
- reasons for market failure
- positive and negative externalities for both
- consumers and firms
- inefficient resource allocation

c. Policies to achieve efficient resource allocation and correct market failure
- application of indirect taxes and subsidies
- price and output decisions under nationalization and privatisation
- prohibitions and licenses
- property rights
- information
- regulatory bodies
- deregulation
- direct provision of goods and services
- pollution permits
- behavioural insights and 'nudge' theory

d. Government failure in microeconomic Intervention
- effectiveness of government policies

e. Social costs and benefits
- cost-benefit analysis
- social costs as the sum of private costs and
- external costs
- social benefits as the sum of private benefits
- and external benefits
- use of cost-benefit analysis in decision-making

UNIT 11: LABOUR MARKET:

a. Demand for labour
- factors affecting demand for labour
- derivation of individual firm's demand for using marginal revenue product theory

b. Supply of labour
- factors affecting supply for labour
- net advantages and the long-run supply of labour

c. Wage determination in perfect markets

d. Wage determination in imperfect markets
- monopsony
- influence of trades unions on wage determination
- influence of government on wage determination

e. Competitive product and factor market forces determining wage differentials

f. Transfer earnings and economic rent

UNIT 12: INEQUALITY AND POLICES TO DISTRIBUTE INCOME:

a. Equity versus efficiency
- price stabilization
- means tested benefits

- transfer payments (transferred to unit book 4)
- progressive income taxes, inheritance and
- capital taxes
- negative income tax
- poverty trap analysis
- Gini coefficient
- Lorenz curve
- inter-generational equity

Book 4 (A2 Level Macroeconomics)

UNIT 1: NATIONAL INCOME STATISTICS:

a. National Income statistics

- Gross Domestic Product (GDP)
- Gross National Product (GNP)
- Gross National Income (GNI)
- transfer payments
- the distinction between money values and real data

b. National debt (government or public sector debt)

c. Business (trade) cycle

UNIT 2: ECONOMIC GROWTH AND DEVELOPMENT:

a. Economic growth and development

- definition of economic growth
- economic development and sustainability
- actual versus potential growth in national output
- factors contributing to economic growth
- costs and benefits of growth, including using and conserving resources

b. Indicators of living standards and economic development

- monetary, non-monetary
- Human Development Index (HDI)
- Measure of Economic Welfare (MEW)
- Human Poverty Index (HPI), later supplanted by the Multidimensional Poverty Index (MPI)
- Kuznets curve

c. National Income statistics and standard of living

- use of National Income statistics as measures of economic growth and living standards
- comparison of economic growth rates and living standards over time and between countries

d. Classification of countries

- characteristics of developed, developing and emerging (BRICS) economies:
  - by population growth and structure
  - income distribution
  - economic structure
  - employment composition
  - external trade and urbanisation in developing economies

e. Policies towards developing economies
- policies of trade and aid
- types of aid
- nature of dependency
- trade and investment
- role of multinationals
- Foreign Direct Investment (FDI)
- external debt
- role of IMF and World Bank
- impact of corruption
- importance of the legal framework in an economy

UNIT 3: KEYNESIAN THEORY OF INCOME AND EMPLOYMENT:

a. The circular flow of income
- closed and open economies
- the circular flow of income between households, firms, government and the international economy

b. Aggregate Expenditure (AE) function
- meaning
- components of AE and their determinants
- average and marginal propensities to save and consume

c. Income determination using
- AE and income approach
- withdrawal (leakage) and injection approach

d. Inflationary and deflationary gaps
- full employment level of income and equilibrium level of income
- output gap and expenditure gap
- inflationary and deflationary gaps

e. Multiplier
- the multiplier

f. Accelerator
- autonomous and induced investment
- the accelerator

UNIT 4: MONEY, BANKING & INTEREST RATE DETERMINATION:

a. Money and banking
- money supply (theory)
- broad and narrow money supply
- sources of money supply in an open economy
    - commercial banks and credit creation
    - role of central bank
    - quantitative easing
    - total currency flow

b. The demand for money and interest rate determination
- Liquidity Preference theory

UNIT 5: MACROECONOMIC POLICIES:

f. Monetary policy

- transmission mechanism of monetary policy
- Quantity theory of money (MV = PT)
- deficit financing
- existence of government failure in macroeconomic policies
- Laffer curve analysis

UNIT 6: EMPLOYMENT/UNEMPLOYMENT:

Employment/unemployment

- size and components of labour force
- labour productivity
- full employment and natural rate of unemployment
- causes of unemployment
- consequences of unemployment
- types of unemployment
- unemployment rate
- patterns and trends in (un)employment
- difficulties involved in measuring unemployment
- policies to correct unemployment

UNIT 7: MACROECONOMIC OBJECTIVES AND CONFLICTS BETWEEN POLICY OBJECTIVES:

Government macro policy aims on:

- inflation
- balance of payments
- exchange rates
- unemployment
- growth and development

Inter-connectedness of problems

- effectiveness of policy options to meet all macroeconomic objectives
- links between macroeconomic problems and their interrelatedness, for example:
  - relationship between internal and external value of money
  - relationship between balance of payments and inflation
  - trade-off between inflation and unemployment; Phillips curve
- problems arising from conflicts between policy objectives on inflation, unemployment, economic growth, balance of payments, exchange rates and the redistribution of income and wealth

Keynesian and Monetarist schools

- different theoretical approaches to how the macro economy functions

Directive Word	What it means
Calculate	Work out using the information provided
Define	Give the exact meaning of
Describe	Give a description of, explain the main features of
Illustrate	Give examples, use a diagram
Outline	Describe the key points without detail
Analyse	Explain the main points in detail, examine closely, separate into parts and show how all the parts connect and link
Compare	Explain the similarities and differences between
Explain	Give clear reasons or make clear the meaning of, use examples and explain the theory behind the question
Consider	Give your thoughts about, with some justification
Assess	Show how important something is, give your judgement on
Comment upon	Give your reasoned opinion on, with explanations
Criticise	Give an opinion but support it with evidence
Discuss	Give the important arguments for and against, often requires a conclusion
Evaluate	Discuss the importance of, judge the overall worth of, make an attempt to weigh up your opinions
To what extent	Give reasons for and against, come to a conclusion with a justification of which arguments are strongest and which are weakest

UNIT 1

Theory of Consumer Behaviour

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Law of diminishing marginal utility

- Law of diminishing marginal utility
- its relationship to derivation of an individual demand schedule

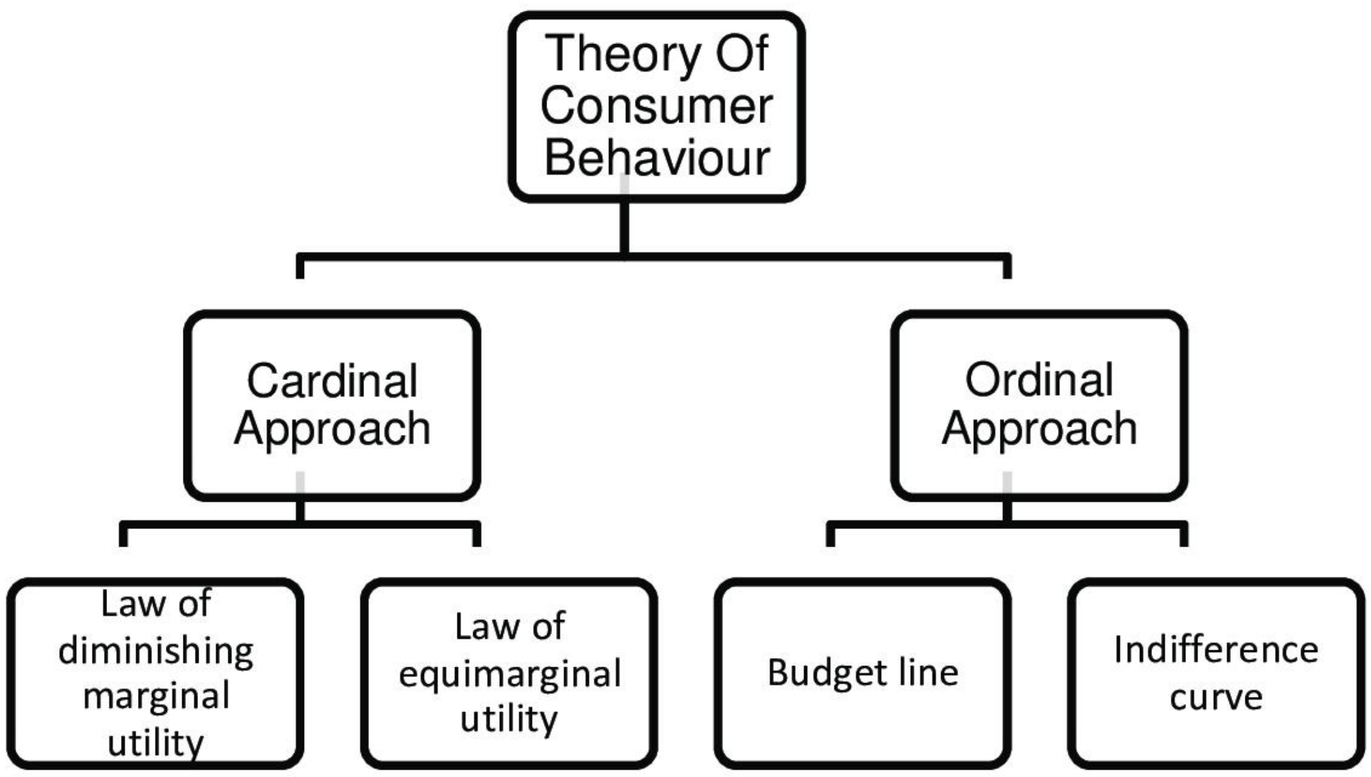
b. Equi-marginal principle

- Equi-marginal principle
- limitations of marginal utility theory
- rational behaviour versus behavioural economic models

c. Indifference curves and budget lines

- income, substitution and price effects for various types of goods

Unit 1 Theory of Consumer Behaviour



The consumer theory explains the consumption behaviour of consumers. Starting from the postulates, economists build up a process of logical deduction to form the theory of consumers so as to deduce and explain the law of demand.

Utility (U):

It is the satisfaction gained from the consumption of a good or a service.

Total Utility (TU):

It is the total satisfaction derived from the consumption of a given amount of goods and services.

$$TU = MU_1 + MU_2 + MU_3 \ldots\ldots MU_n$$

Marginal Utility (MU):

It is the utility gained from the consumption of a unit extra of a good or service.

$$MU = \frac{\Delta TU}{\Delta Q}$$

Marginal utility can be calculated by taking the derivative of total utility with respect to output.

$$MU = \frac{TU_2 - TU_1}{Q_2 - Q_1}$$

Cardinal Approach

The Basic Assumptions of Cardinal Theory:

1. Utility can be measured in whole numbers (cardinal numbers), .e.g., 1, 2, 3, 4… Cardinalists believe that each consumer has a personal 'utilometer' to measure the utility into units called 'utils'.
2. Cardinalists believe that utility depends on the quantity of goods consumed. They also think that utility from different goods can be added, .i.e.:
1. $TU = (U_1Q_1) + (U_2Q_2) + (U_3Q_3) + \ldots. (U_nQ_n)$
3. All consumers behave in the same way.
4. Consumers are rational: They are well aware of what incomes they have, what the prices of goods are, and they will always prefer more of a good over less.
5. The marginal utility of money remains constant.

Cardinal theory presents two laws to explain consumer behaviour:

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i. Law of Diminishing Marginal Utility
ii. Law of Equi-marginal Utility

Law of Diminishing Marginal Utility:

With the continuous and successive use of any commodity, the marginal utility derived from the extra unit is always less than the marginal utility derived from the previous unit.
In other words, when the consumer continuously uses a certain commodity, the total utility derived from consumption rises at a decreasing rate.

Assumptions:

1. **Continuous use:** It is assumed that the commodity should be used continuously. If there is an interval between the consumption of the units of the commodity, then this law will not be applicable.
2. **Reasonable units:** It is also assumed that the units of the commodity used should be suitable and reasonable. If the units are too small, then the law will not be applicable.
3. **No change in income:** It is also assumed that the income of the consumer does not change. Otherwise, this law will not be applicable.
4. **No change in trends:** It is also assumed that there is no change in trends and fashion. If there is a sudden change in trends, then this law will not be applicable.
5. **No change in the prices of substitutes:** This assumption is taken because if the prices of substitutes change, then the demand for the commodity changes and this law will no longer hold true.
6. **No change in taste:** The reason for this assumption is best illustrated through an example. If, for example, a consumer somehow improves the taste of wine that he or she is consuming, then every next unit of wine consumed increases marginal utility, which is against our law.
7. **No change in weather:** Another assumption is that the weather remains unchanged. If the weather changed, then demand for a certain commodity will change as well, and the law will no longer be applicable.
8. **Rare collection:** The law does not apply in the case of rare collections. If a person has a hobby of collecting rare coins, the more coins he collects, the greater will be his happiness; whereas, according to this law,his happiness should decrease with each successive coin that he collects. The law, therefore, is inapplicable.

To understand LDMU, let us construct an example based on hypothetical data.

Q	MU	TU
1	10	10
2	8	18
3	6	24
4	4	28
5	2	30
6	0	30
7	−2	28

Suppose that the above table states the utilities gained from the consumption of different units of apples. It is clear that, when a person feels hungry, by eating one apple, he or she would obtain a higher utility than through the consumption of a second one. As he or she continues to eat apples, the MU from every extra unit will continue to fall, decreasing to zero at the 6th unit consumed. From here onwards, the MU becomes negative because overeating will cause 'disutility' (i.e., it would decrease satisfaction, instead of increasing it). Graphically:

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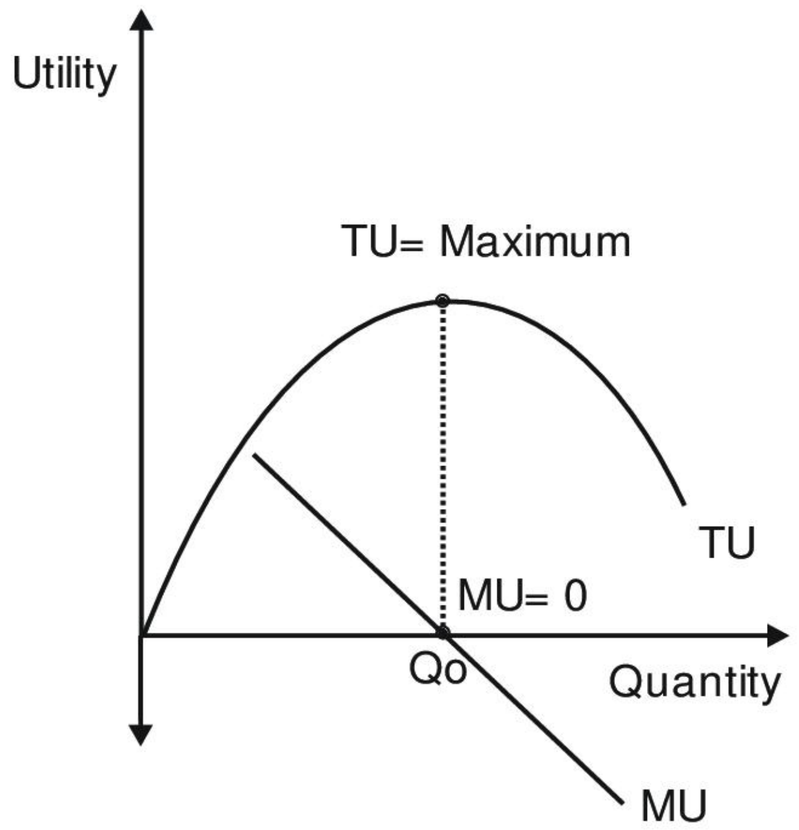

The relationship between MU and TU:

MU	TU
Positive	Increases
Zero	Maximum
Negative	Decreases

The relationship is clear from the graph. MU is positive upto the 5th unit, so TU continues to rise till the 6th unit; At the 6th consumed, MU becomes zero and TU is at its maximum; and, afterwards, when the 7th unit is consumed, MU is –2, so TU falls from 30 to 28. This allows us to conclude two things regarding LDMU:

- With continuous consumption, MU falls with an increase in consumption.
- TU increases with a decreasing rate.

Consumer Equilibrium using LDMU

Cardinal theorists believe that whenever consumers purchase any commodity, they will have to evaluate their MU.

Rational consumers (ones who seek to maximize their total utility) will only buy the commodity until the marginal utility they gain from it exceeds the price paid for it. As price exceeds marginal utility, consumption will decrease, and the equilibrium will be at the point where both curves intersect. So:

As long as

MU > P → Consumption ↑
MU < P → Consumption ↓
MU = P → Consumer Equilibrium

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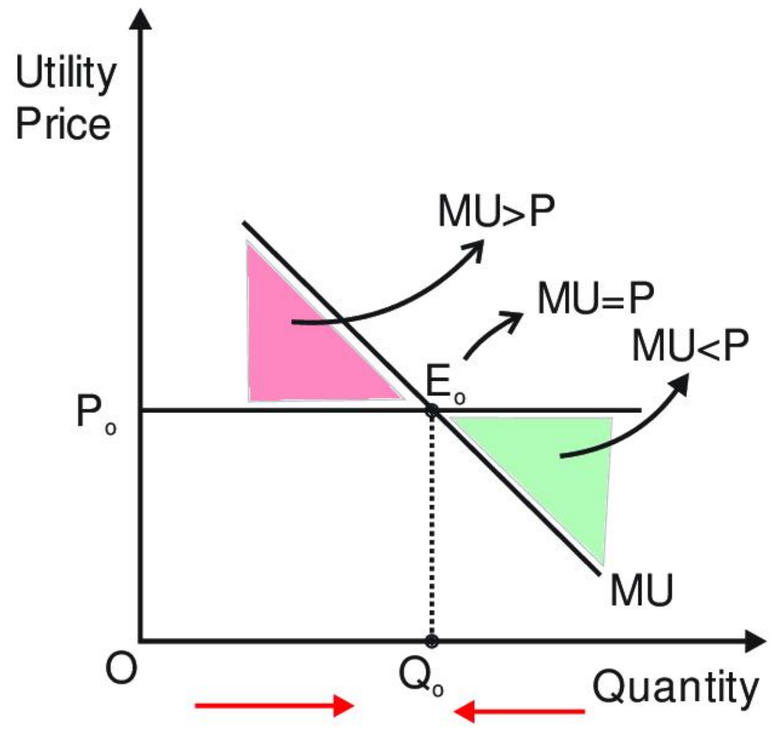

However:
MU = Measured in utils
Price = Measured in currency, such as $, Rs, €, etc.
Therefore, a constant MU of money is needed to determine consumer equilibrium.

Example:

The table shows the marginal utility that an individual derives from consuming different quantities of a good.

Quantity	MU
1	16
2	14
3	12
4	10
5	8

The individual's marginal utility of money is $1 = 2 utils.
What is the maximum quantity of the good that the individual will buy when its price is $6?

Solution:
First, we will convert price in dollars to utils; second, we will find consumer equilibrium at the point where MU=P. This is shown in the following table.

Quantity	**MU (utils)**	**Price (utils)**
1	16	6 x 2 = 12
2	14	6 x 2 = 12
3	**12**	**6 x 2 = 12**
4	10	6 x 2 = 12
5	8	6 x 2 = 12

Hence, consumer equilibrium will be established at 3 units of output.

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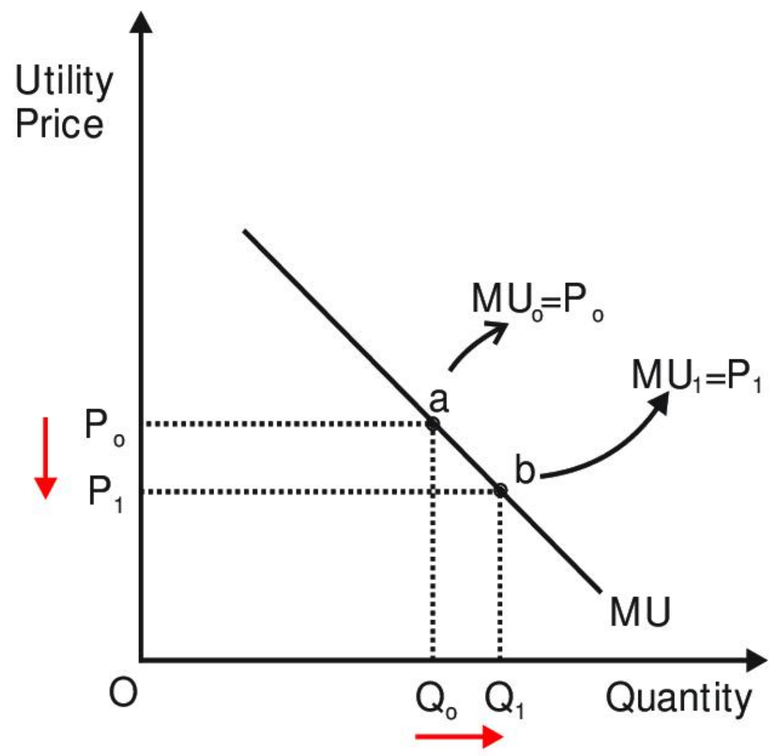
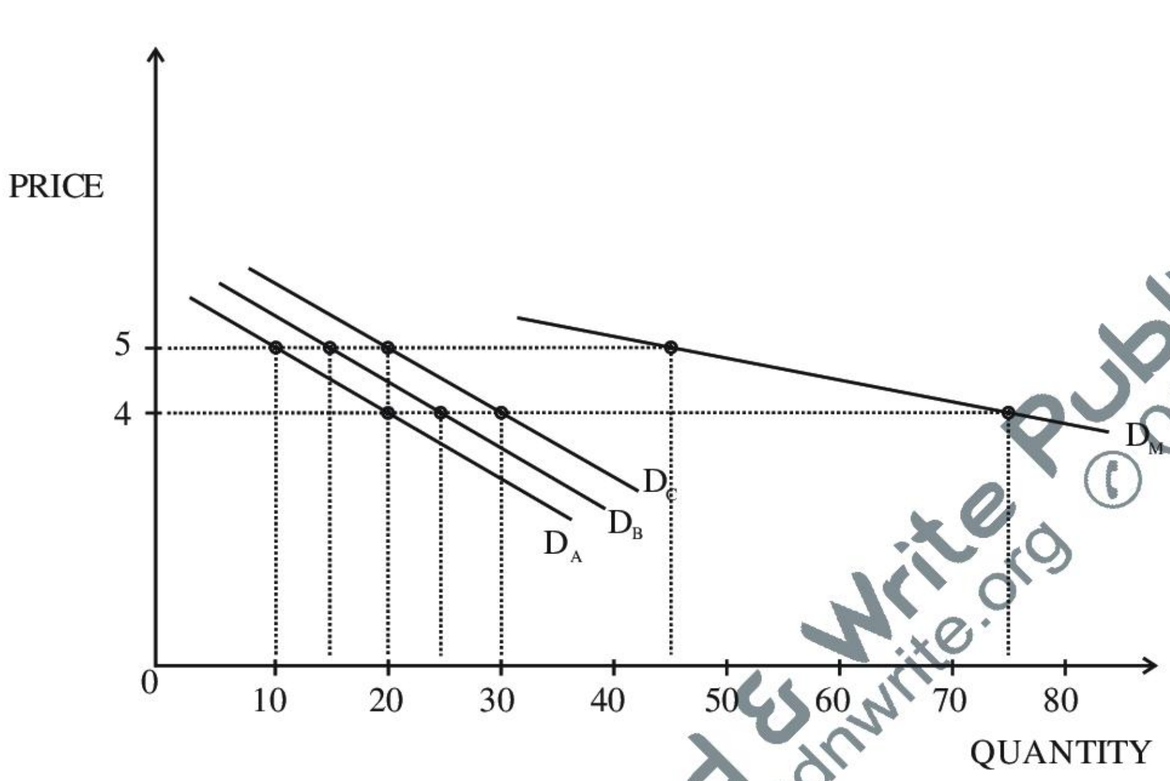
LDMU and derivation of a demand curve:

According to LDMU, if a consumer is initially in equilibrium at point 'a' where $MU_0=P_0$, as shown in the following diagram:



- If the price of the product falls from P_0 to P_1, then
- $MU_0 > P_1$
- The consumer will be in disequilibrium
- A rational (utility-maximizing) consumer will be likely to increase his or her consumption beyond Q_0
- According to LDMU, MU will fall with the increase in consumption
- The consumer will reach a new equilibrium at point 'b', where $MU_1=P_1$, as shown in the diagram above.
- A curve joining points "a" and "b" shows the marginal utility curve and is also the individual demand curve.
- The horizontal sum of all individual demand curves (D_A,D_B,& D_C) for a product in a market will form the market demand curve (D_M). This is shown in the diagram below:



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Law of Equi-marginal Utility

To explain consumer behaviour among various goods, LDMU alone is not enough. Cardinal theorists present the law of equi-marginal utility to further explain consumer behaviour.

It states that:

A consumer is in equilibrium when he spends his fixed income on different goods with given prices in such a way that the MU of the last unit of money spent on each good is equal.
Mathematically, a consumer's fixed income and fixed prices of the goods he or she purchases are given by the budget constraint:

$$P_xQ_x + P_yQ_y + P_zQ_z + \ldots\ldots = I$$

Where:
Q_x = Quantity of 'X' consumed; P_x = Price of good 'X'; Q_y = Quantity of 'Y' consumed;
P_y = Price of 'Y'; and I = Income of the consumer.

According to the law of equi-marginal utility:

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = \frac{MU_z}{P_z}$$

Where:
MU_x, MU_y, MU_z are the marginal utilities of X, Y, and Z, respectively. P_x, P_y, and P_z are the prices of X, Y, and Z, respectively.
To understand the law of equi-marginal utility, let us present a hypothetical example where, for a consumer, if:

$$\frac{MU_x}{P_x} > \frac{MU_y}{P_y}$$

Then, for example:

	Good x	**Good y**
Marginal utility (MU)	20	30
Price	$ 2	$6
$\frac{MU}{P}$	10	5
Consumer expenditure	Increase	Decrease

A rational consumer will increase his or her consumption of good x by reducing consumption of good y. According to LDMU, as the consumption of good x increases, its marginal utility decreases, and as the marginal utility of good y starts increasing, its consumption falls. This will continue to happen until the last dollar spent on either good generates the same utility.
If:

$$\frac{MUx}{Px} < \frac{MUy}{Py}$$

Then, for example:

	Good x	**Good y**
Marginal utility (MU)	20	30
Price	$2	$2
$\frac{MU}{P}$	10	15
Consumer expenditure	Decrease	Increase

A rational consumer will increase his or her consumption of good y by reducing consumption of good x. According to LDMU, as the consumption of good y increases, its marginal utility decreases, and as the

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marginal utility of good x starts increasing, its consumption falls. This will continue to happen until the last dollar spent on either good generates the same utility.
If:

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

Then, for example:

	Good x	**Good y**
Marginal utility (MU)	20	30
Price	$ 2	$3
$\frac{MU}{P}$	10	10
Consumer expenditure	No change	No change

Hence:
A rational consumer will be in equilibrium when the last unit of currency spent on each good generates the same MU—i.e.:

$$\boxed{\frac{MU_x}{P_x} = \frac{MU_y}{P_y}}$$

Sample Question (MCQ):

The table shows the marginal utility derived by a consumer who devotes the whole of his weekly income of $42 to two goods, X and Y, whose unit prices are $3 and $6 respectively.

Unit	**Marginal utility of X (units)**	**Marginal utility of Y (units)**
1	12	34
2	11	30
3	10	26
4	9	22
5	8	18
6	7	14
7	6	10
8	5	6

In order to maximize his or her utility, which quantities of X and Y should the consumer purchase?

	X	**Y**
A	2	6
B	4	5
C	6	4
D	8	3

Solution:
Using the law of equi-marginal utility:

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$$

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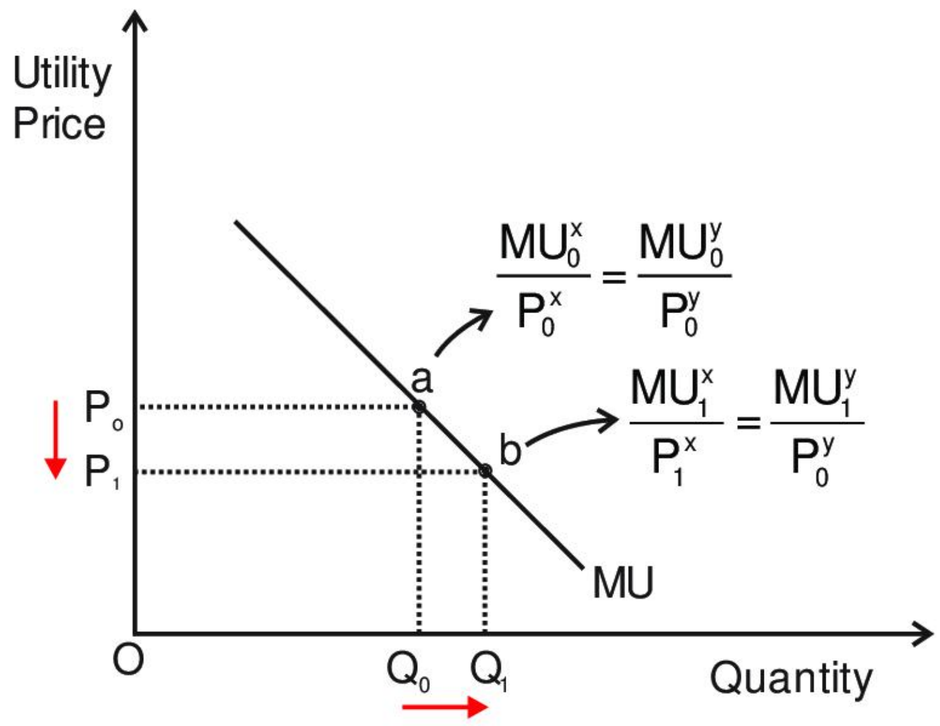
Unit	MU_x	MU_y	$\frac{MU_X}{P_X}$	$\frac{MU_Y}{P_Y}$
1	12	34	4	5.67
2	11	30	3.67	5
3	10	26	3.33	4.33
4	9	22	3	3.67
5	8	18	2.67	3
6	7	14	2.33	2.33
7	6	10	2	1.67
8	5	6	1.67	1

Among the four options $\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$ only in option B—i.e.: $\frac{9}{3} = \frac{18}{6} = 3$

LEMU and derivation of a demand curve:

Suppose that a rational (utility-maximizing) consumer is in equilibrium at point "a", as shown in the following diagram:



Initially, the per dollar marginal utility for both goods x and y is equal—i.e.:

$$\frac{MU_o^x}{P_o^x} = \frac{MU_o^y}{P_o^y}$$

If the price of good x falls,the per dollar marginal utility from good x will immediately become greater than that of good y—i.e.:

$$\frac{MU_o^x}{P_1^x} > \frac{MU_o^y}{P_o^y}$$

According to LDMU, as the consumption of good x increases, its marginal utility decreases, and asthe marginal utility of good y starts increasing, its consumption falls. This will continue to happen until the last dollar spent on either good generates the same utility (at point b). At point b:

$$\frac{MU_1^x}{P_1^x} = \frac{MU_1^y}{P_o^y}$$

The horizontal sum of all individual demand curves (D_A, D_B, & D_C) for a product in a market will form the market demand curve (D_M). This is shown in the diagram below:

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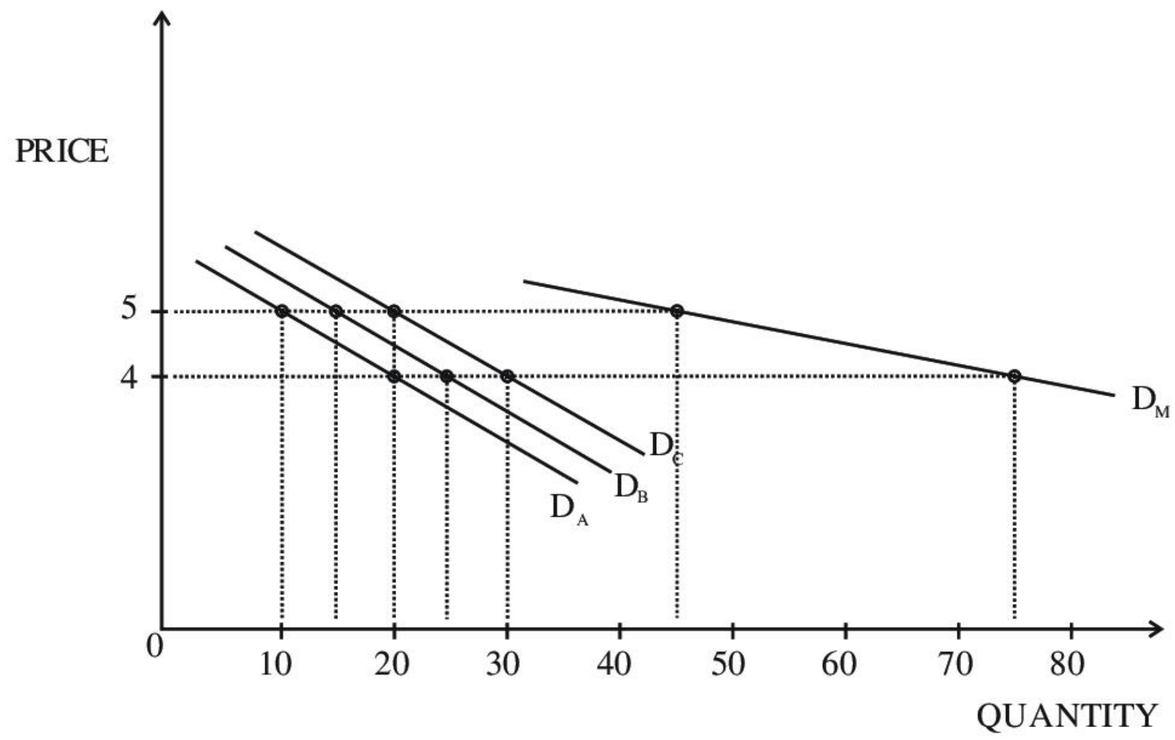

Limitations of the Law of Equi-marginal Utility:

1. It is difficult to measure utility through a cardinal approach, because no consumer is thought to possess a utilometer with which to measure the utility they gain. Furthermore, utility from different commodities or for different people can neither be added nor compared.
2. LDMU is only a single good model.
3. Tastes of consumers change continuously.
4. Incomes do not remain constant in society.
5. In reality, it is very hard to estimate prices and MU's and what ratios make them equal.
6. The law of equi-marginal utility suggests that consumers will substitute the product with a lower MU-to-price ratio with one for which the MU-to-price ratio is high; but, in real life, consumers are many times unaware of any available substitutes. In this situation, substitution will not occur and the law of substitution will not be applicable.
7. Nowadays, purchases are mostly made on the basis of customs, traditions, and demonstrations. These factors are not considered in the law of equi-marginal utility.
8. It is not possible to assess the lifetime of consumer durables; and so, consequently, their MU cannot be accurately assessed.
9. Impulse buying
10. The impact of advertising

Ordinal Approach:

Assumptions:

1. The consumer is capable of making comparisons between goods and substituting them to show his indifference on the goods consumed.
2. Consumers have some preference in mind before they make purchases. They are consistent in their purchases and are also aware that differences in satisfaction from consumption exist, but they **cannot** tell *exactly* how much satisfaction can be obtained—i.e., there is exists the possibility of **transitivity**.
3. Utility maximization and a state of optimum are revealed by the fact that the consumer always **prefers more to less**.

Budget line

It is the line that shows the maximum possible combinations of two goods that the consumer can buy, given a fixed money income and prices of goods.

Example:
Money income = \$12 P_x = \$2 P_y = \$1
Combinations that a consumer can buy within his or her money income and the prices of the goods can be found through the budget constraint:

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$$\text{Income} = P_xQ_x + P_yQ_y$$

If a consumer spends his or her income completely and saves nothing, then he or she can purchase the following combinations of good x and y:

Combinations	Q_x	Q_y
(a)	6	0
(b)	5	2
(c)	4	4
(d)	3	6
(e)	2	8
(f)	1	10
(g)	0	12

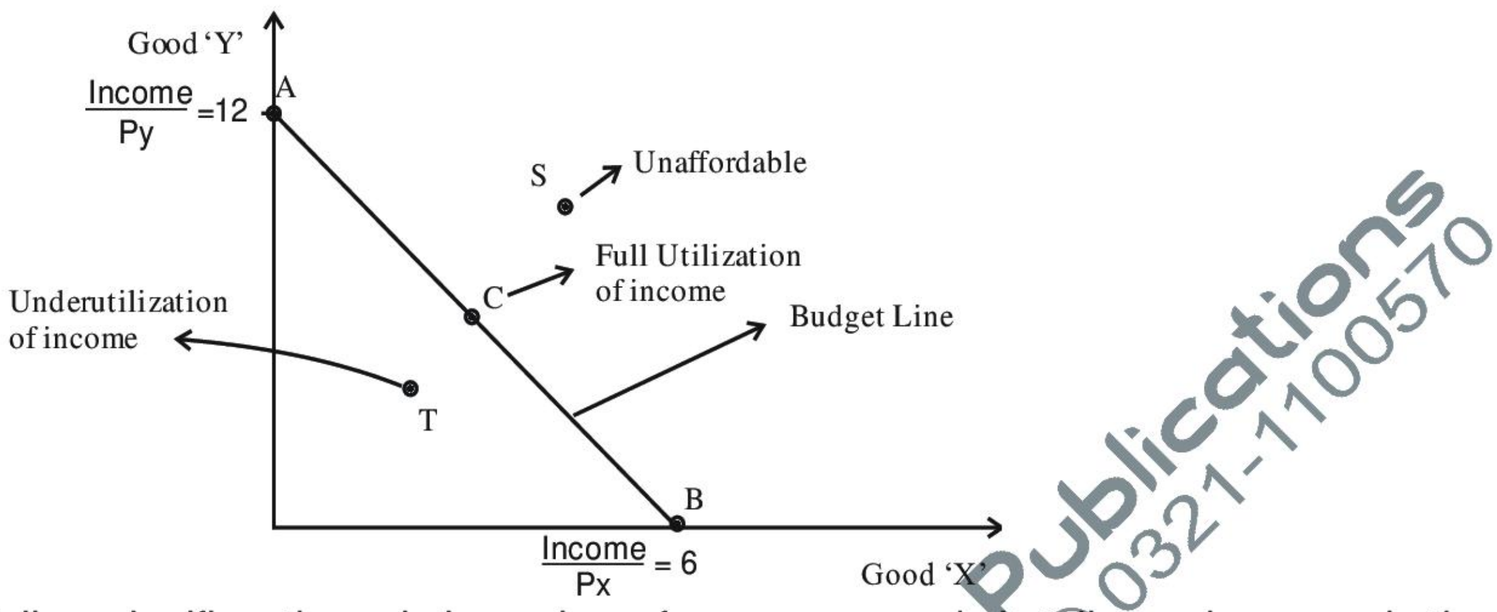
If the consumer spends the entirety of his or her income on good x, then:

$Q_y=0$ Q_x=Maximum $= \frac{\text{Income}}{P_x} = \frac{12}{2} = 6$

If the consumer spends the entirety of his or her income on good y, then:

$Q_x=0$ Q_y=Maximum $= \frac{\text{Income}}{P_y} = \frac{12}{1} = 12$

By joining the above two extreme points with a line, we construct the budget line shown below:



The slope of the budget line signifies the relative price of any one good. It tells us how much the consumer must give up in terms of one good in order to afford a unit of the other.

Changes in the Budget Line:

There might be a parallel or a pivotal shift in the budget line. Depending on the type of change, the budget line might shift if:

1. Money income changes
2. The price of a good changes
3. Both money income and the price of a good changes

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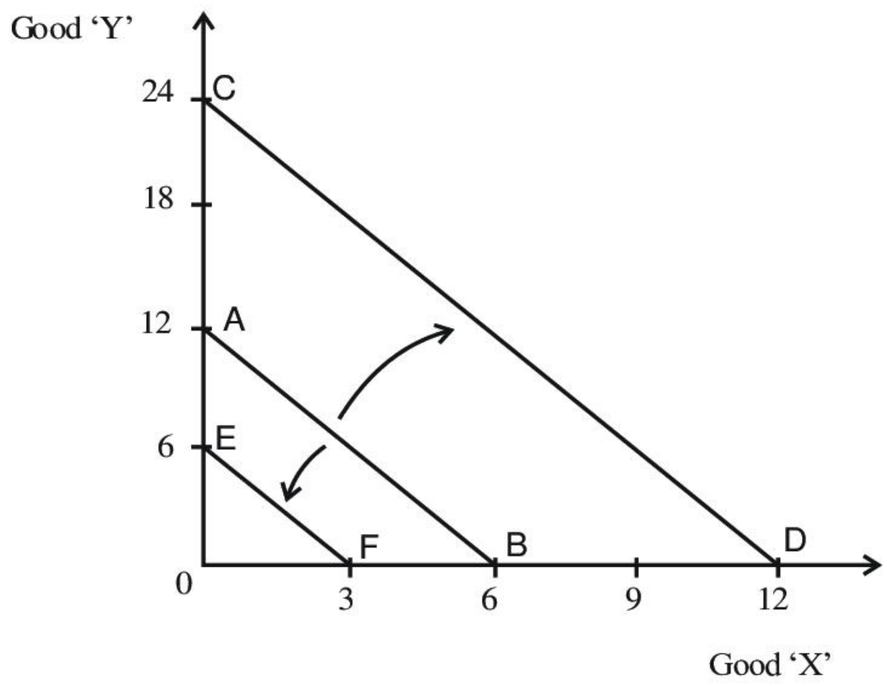
1. Money income changes:

	Initially	Income increases	Income decreases
Money income	$12	$24	$6
Price of good x	$2	$2	$2
Price of good y	$1	$1	$1
Q_x=Maximum $=\frac{\text{Income}}{P_x}$	6	12	3
Q_y=Maximum $=\frac{\text{Income}}{P_y}$	12	24	6
Budget line	AB	CD	EF



2. The price of a good changes:

	Initially	Price of good x decreases	Price of good x increases
Money Income	$12	$12	$12
Price of good x	$2	$1	$4
Price of good y	$1	$1	$1
Q_x=Maximum $=\frac{\text{Income}}{Px}$	6	12	3
Q_y=Maximum $=\frac{\text{Income}}{Py}$	12	12	12
Budget line	AB	AC	AD

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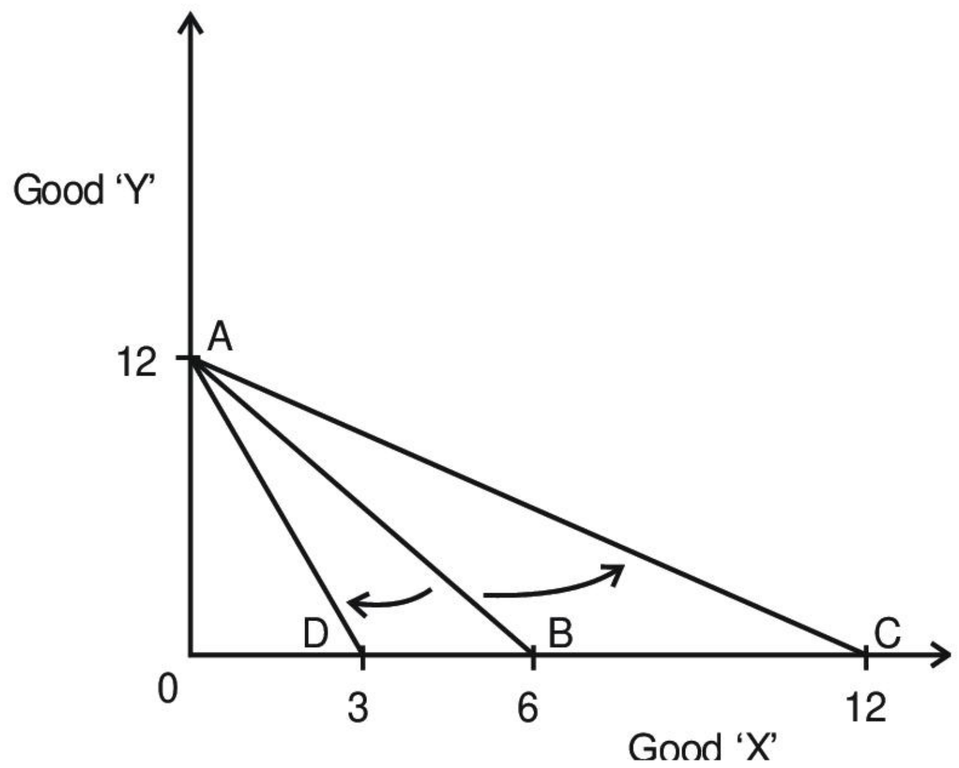
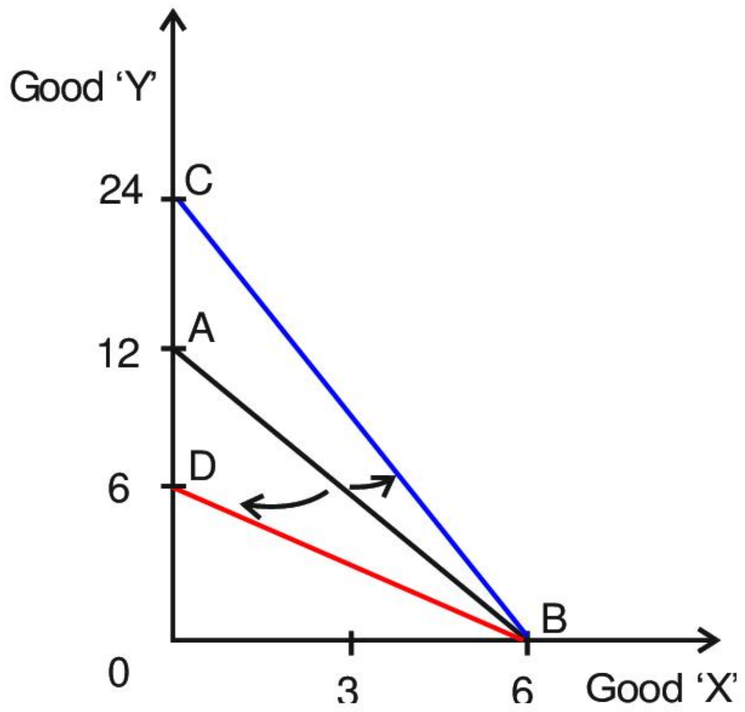


Similarly, changes in the price of good y can shift the budget line as shown below:



Consequences of changes in budget line:

Any change in the budget line can have consequences on:
1. Real income
2. Relative prices

Money income	Real income
Income in terms of $, PKR, etc., is known as money income.	Income in terms of purchasing power (.i.e.,the amount of goods and services one can buy within a given fixed money income and prices of goods) is known as real income. Real income = $\frac{\text{Money income}}{\text{Price}}$

Real income can change due to two reasons, .i.e.:

i. Changes in the money income of the consumer
ii. Changes in the price of the product

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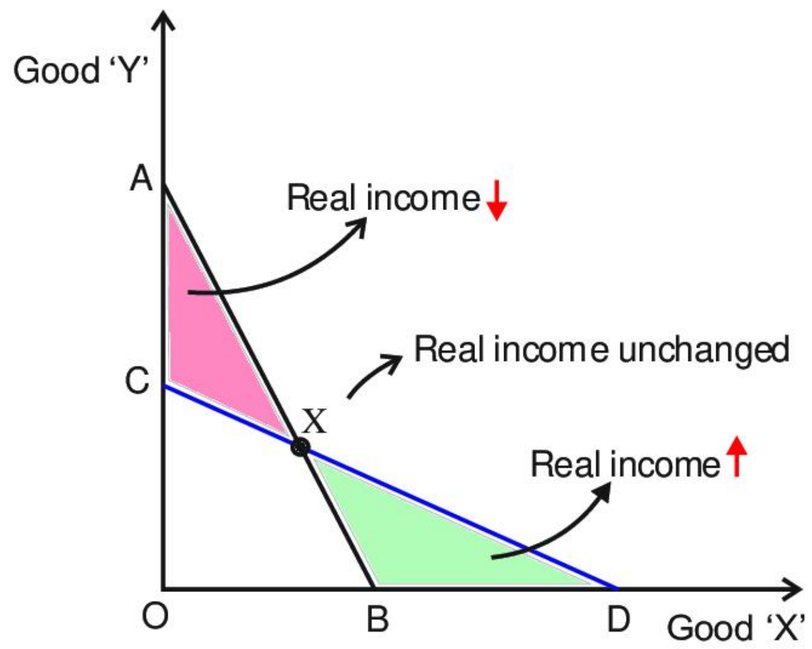
1. Real Income and the Budget Line

The budget line shows real income. The higher the budget line, the greater will be real income. In the case of a parallel or a pivotal shift in the budget line, we are certain about real income; however, it will be uncertain if there is an intersecting shift, as shown in the diagram below:

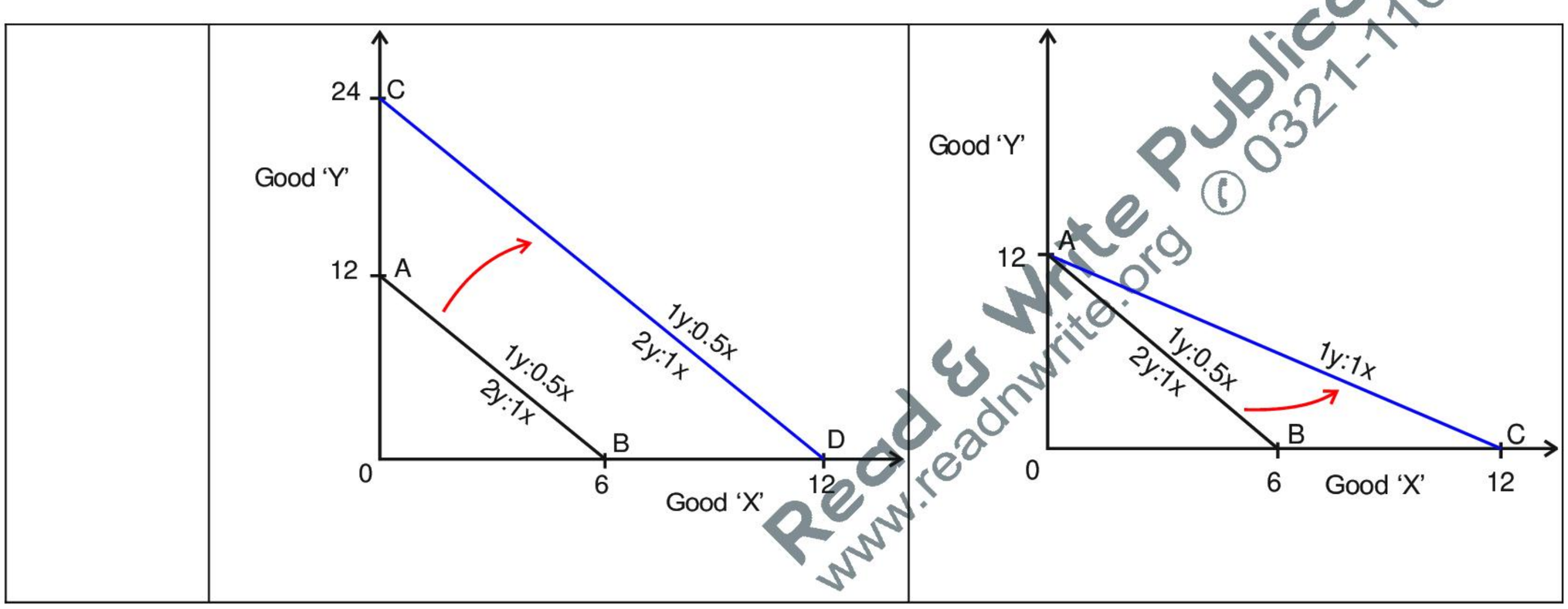


	Between points A and X	At point X	Between points X and B
Relative positions of budget lines	AB>CD	AB=CD	AB<CD
Real Income	Decreases	Unchanged	Increases

2. Absolute or relative price and the budget Line:

Absolute price	Relative price
When the price of a product is expressed in terms of $, PKR, etc.	When the price of a product is expressed in terms of its opportunity costs.

In the case of parallel shifts in the budget line, relative prices remain unchanged, but in the case of non-parallel shifts, relative prices change.
This can be illustrated through the following diagrams:



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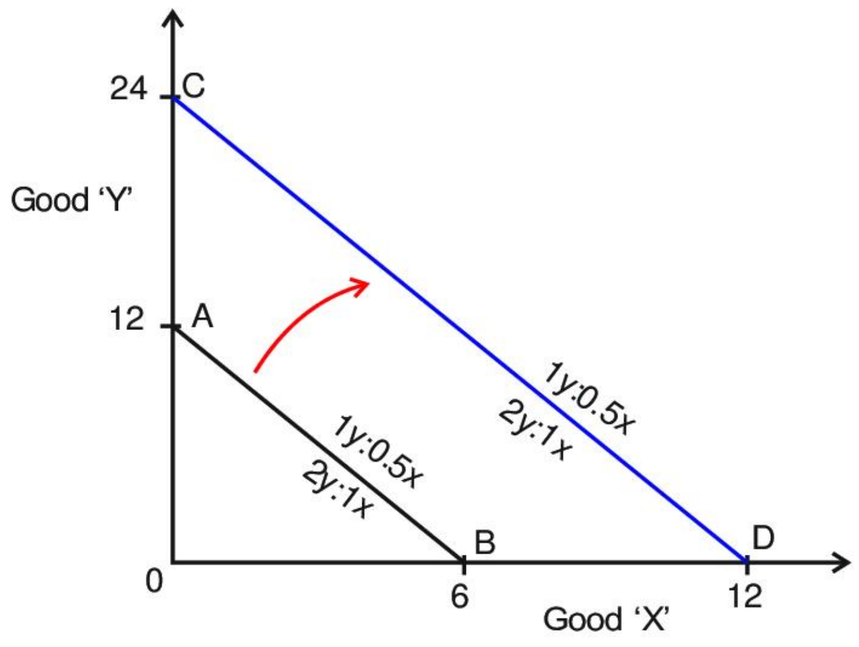
	Initially	Later on	Initially	Later on
Money income	$12	$12	$12	$12
Absolute price of good x	$2	$1	$2	$1
Absolute price of good y	$1	$0.5	$1	$1
Relative price of good x (opportunity cost of 1x)	2y	2y	2y	1y
Relative price of good x (opportunity cost of 1y)	0.5x	0.5x	0.5x	1x
Budget line	AB	CD	AB	AC

What is and what is not definitely true when the budget line shifts?

After a shift in the budget line we can only certain about the consequences—i.e., the effects on real income and on relative prices. We can never be sure as to what the cause of the shifts in the budget line was, due to the fact that every kind of shift in the budget line has more than one possible reason.

This can be explained by the following different cases:

Case	What is and what is not definitely true?
1: (Parallel outward shift)  	**Causes (possible but not necessarily true):** • Money income increased. • The prices of goods x and y both fell by the same proportion. **Consequences (must definitely be true):** • Real income increased. • Relative prices stayed constant.
2: (Pivotal outward shift along the x-axis)	**Causes (possible but not necessarily true):** • The price of good x decreased. • The price of good y and money income both increased.

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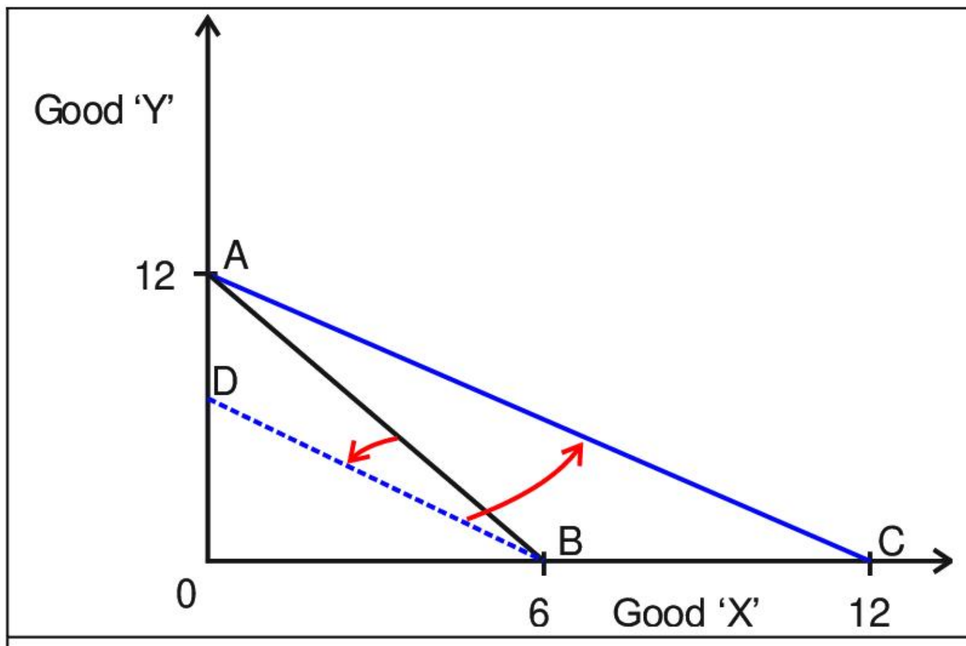
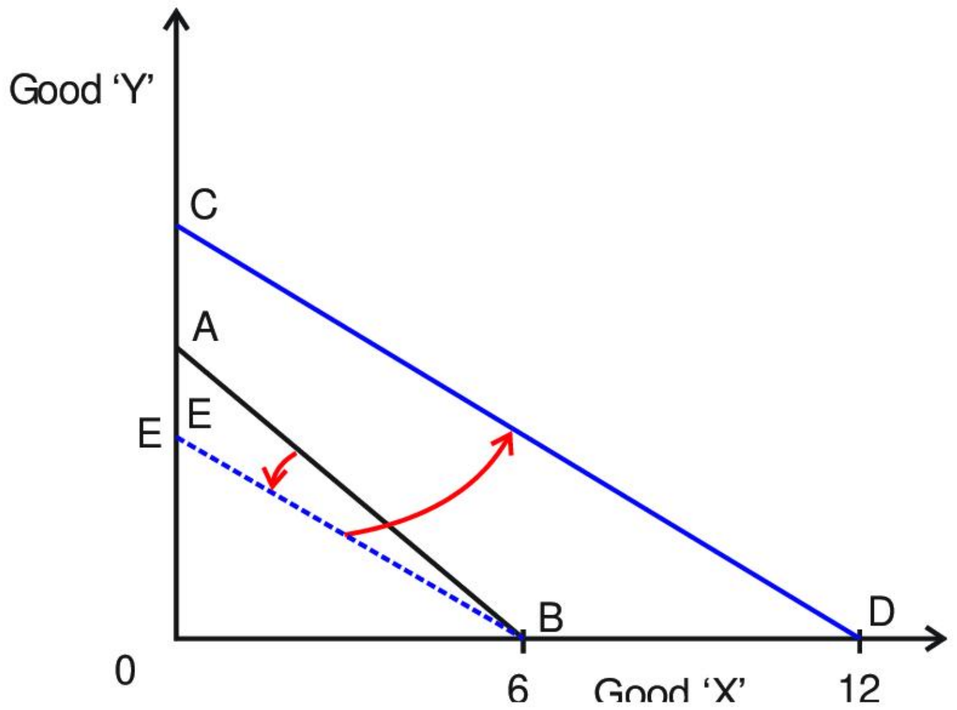


Consequences (must definitely be true):

- Real income increased.
- Good x became relatively cheaper and good y relatively more expensive.

3: (Non-parallel shift)



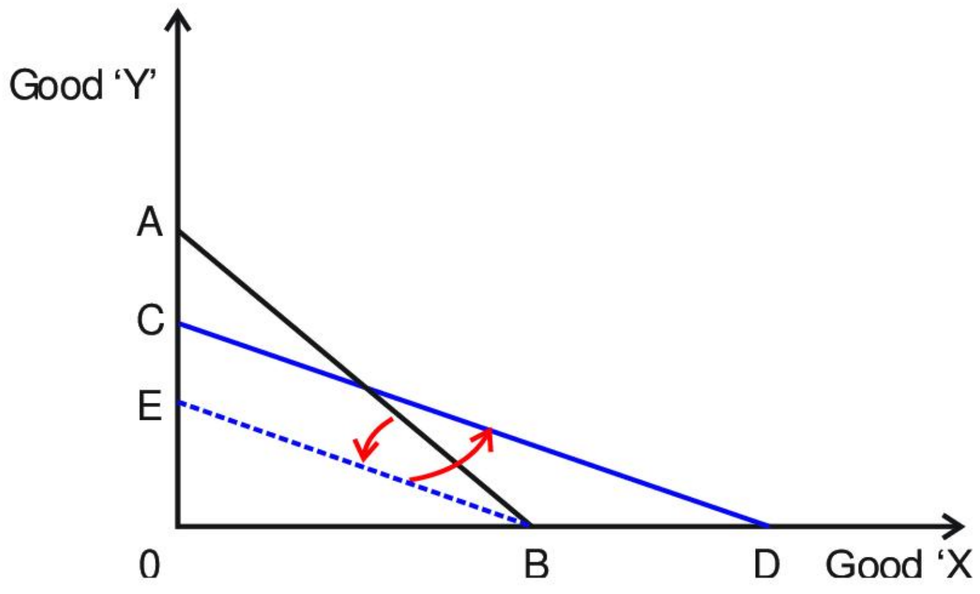
Causes (possible but not necessarily true):

- The prices of goods x and y both decreased, but the extent of the decrease in the price of good x was greater than that of good y.
- The price of good y and money income both increased.

Consequences (must definitely be true):

- Real income increased.
- Good x became relatively cheaper and good y relatively more expensive.

4:(Intersecting shift)



Causes (possible but not necessarily true):

- The price of good x decreased and the price of good y increased.
- The price of good y and money income both increased.

Consequences (must definitely be true):

- Real income increased.
- Good x became relatively cheaper and good y relatively more expensive.

Indifference Curves

It is the curve that shows all those combinations of two goods for which the total utility of a consumer remains the same and, therefore, he will be indifferent among them.

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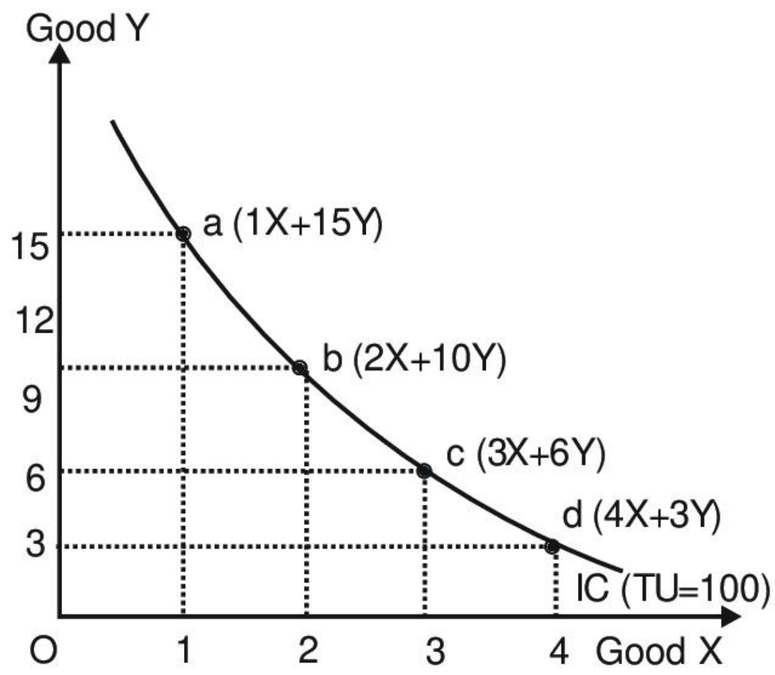
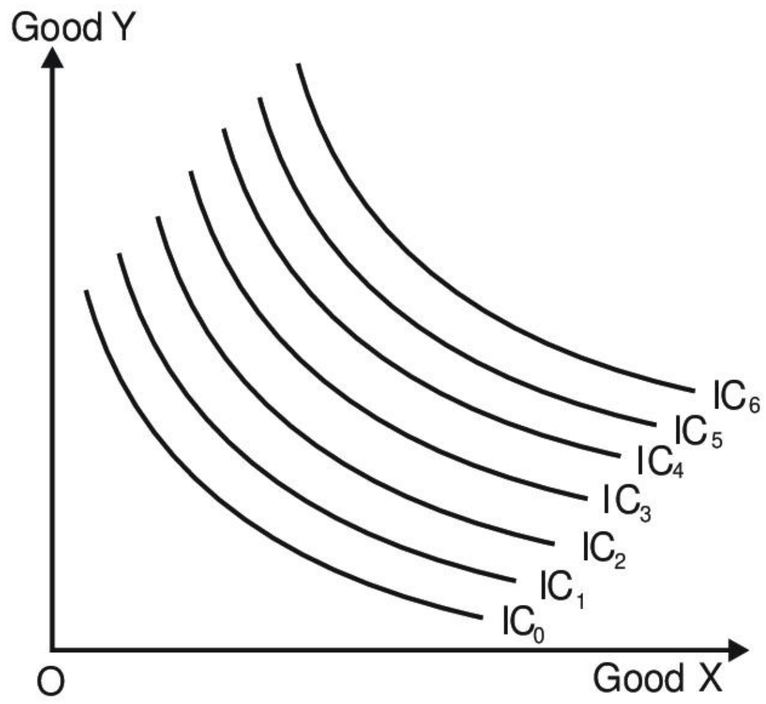
Combination	Good X	Good Y	TU= TU_x+ TU_Y
a	1	15	100
b	2	10	100
c	3	6	100
d	4	3	100



The properties ofan indifference curve:

1. The **slope** of the indifference curve is **negative**: There is some degree of substitution between the two goods.
2. The curve is **convex to the origin**: The marginal rate of substitution for the two goods is diminishing along the curve. The marginal rate of substitution (MRS) in consumption=$\frac{\Delta Y}{\Delta X}$= the amount of good Y that had to be given up per each unit of good X to maintain the same level of utility, along any point on the indifference curve.
3. A curve **farther away from the origin** implies a higher level of preference than one nearer to the origin. Again, the magnitude between any two indifference curves does not matter.
4. As a consumer changes his or her choices continuously, there must be at least one other curve between any two indifference curves; so, there may be an **infinite number of indifference curves** for a single consumer of a combination of goods.



5. **No two curves** in an indifference map **intersect**. It is, therefore, only useful to compare points on the same curve. The marginal rate of substitution is only a measure of change along the same curve, not different curves, because different curves represent different levels of preference and cannot be compared.

Consumer Equilibrium through the Ordinal Approach:

The indifference curve and the budget line together constitute consumption behaviour. Graphically speaking, the two curves meet at a point where the indifference curve is tangent to the budget line to present a unique or internal solution. This point of tangency represents the highest level of preference obtained by a person given a fixed amount of money income.

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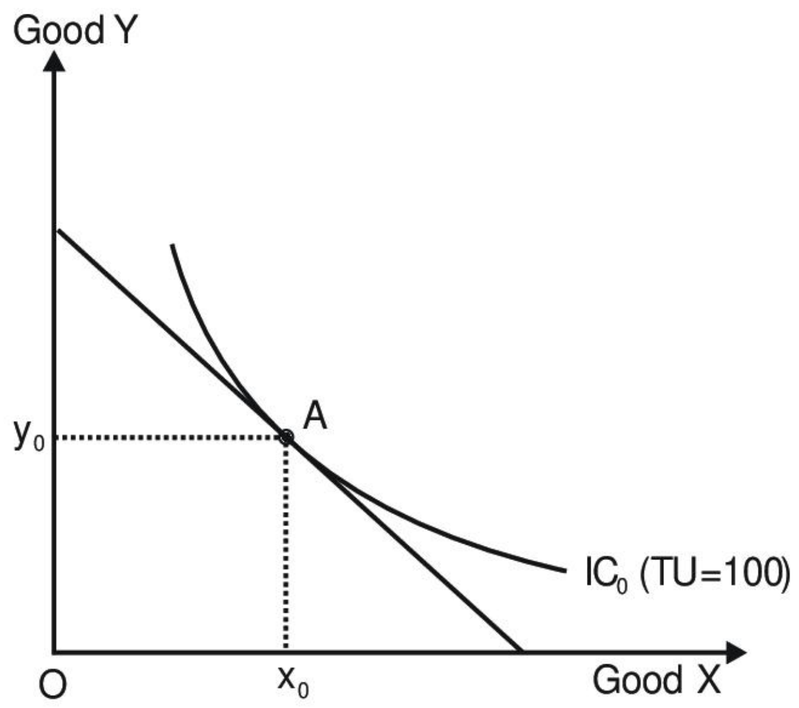


In the above diagram, point A represents consumer equilibrium. This point is also the point of optimum condition or utility maximization.
Consumer equilibrium will change with changes in the budget line, which may occur due to changes in the income of the consumer or the price of the product.

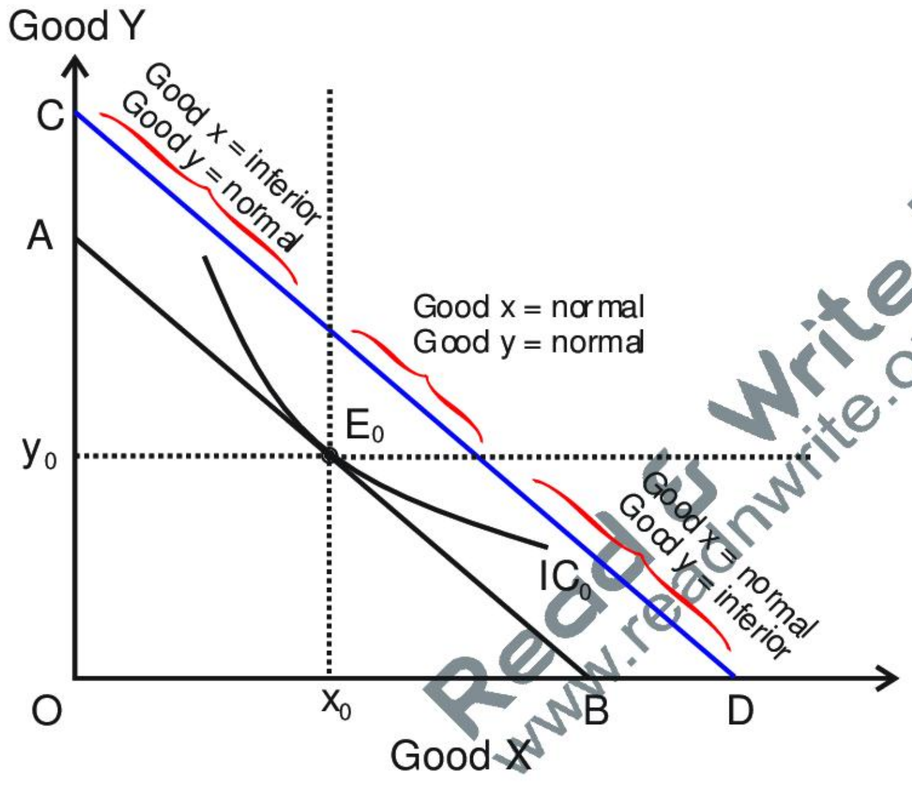
1. Effect of changes in income on consumer choice

Income Consumption Curve (ICC)

The ICC is a curve that joins all the points of contact between the indifference curve and the constant-slope budget line when the budget line shifts outward due to increases in money income.

Shape of The ICC	Goods
Upward sloping	Both are normal goods
Downward sloping	Good x = Normal Good y = Inferior
Backward bending	Good x = Inferior Good y = Normal

Graphical explanation:



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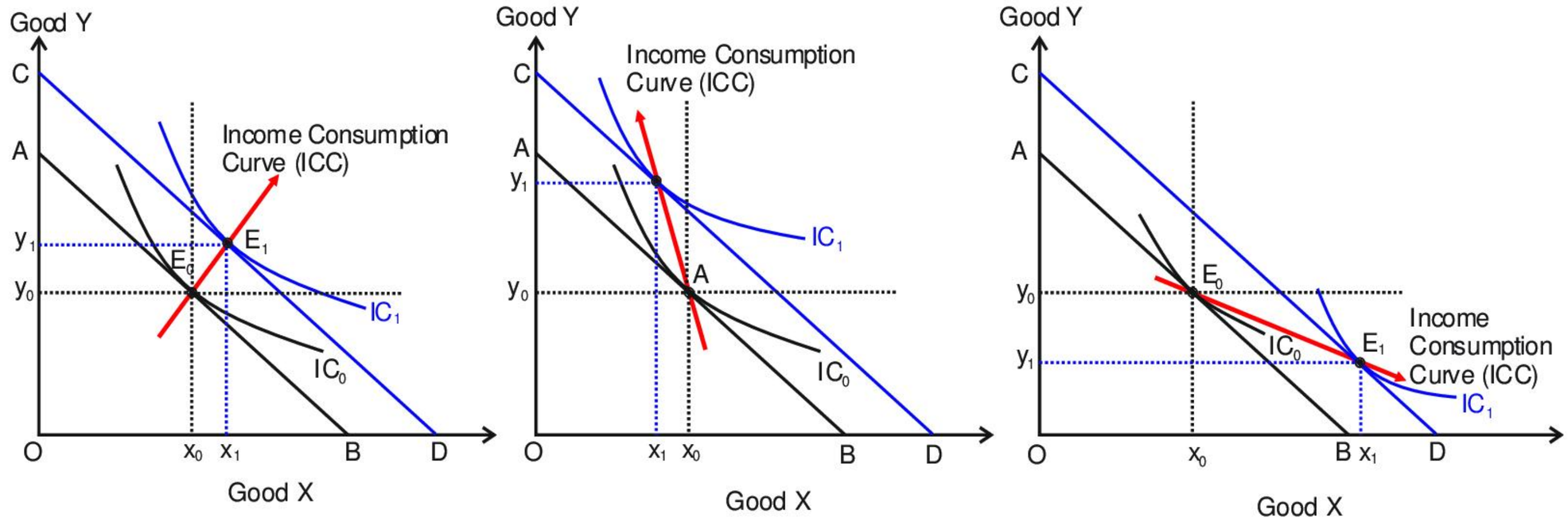

2. Effect of a change in price:

Income and substitution effect of a price change using an indifference curve

Price Effect or Real Effect (P.E.):
It is, ceteris paribus, the change in the consumption of a product due to changes in its price.

Substitution Effect (S.E.):
It is, ceteris paribus, when a price decrease causes the consumer to increase the consumption of the relatively cheaper product by postponing the consumption of other, more expensive products. It forms part of the price effect.

Income Effect (I.E.):
It is, ceteris paribus, when a change in a consumer's real income causes him or her to change consumption patterns. It forms part of the price effect.

Price effect(P.E) = Substitution effect(S.E) + Income effect(I.E)

Numerical Example:
To understand the relevance of S.E. and I.E. for normal and inferior goods, let us consider an example:
Suppose a consumer's money income is $24. He buys only two goods: trousers and shirts.

Price of a trouser = $3
Price of a shirt = $1

Let us assume that his initial decision is to buy 6 trousers and 6 shirts. Now, if the price of trousers falls to $2 per unit, he would change his consumption level of trousers because of two reasons:

i. Trousers are relatively cheaper now and he will substitute trousers for shirts (S.E.);
ii. His real income (purchasing power) is higher and he is capable of buying more of both trousers and shirts (I.E.).

If the consumer decides to reduce his consumption of shirts by 4 units and decides to buy 2 more trousers instead, this would be the substitution effect of the price fall of trousers. After the S.E., the consumption levels are:

Shirts = 6−4 = 2 units of shirts.
Trousers = 6+2 = 8 units of trousers.

The substitution effect (S.E.) of a price change would be same, irrespective of whether the good is inferior or normal. However, the income effect of the price change would be different for different types of goods. For example: A fall in the price of trousers to $2 raises the purchasing power of the consumer by $6 (the money left after buying the initial combination at new prices); if trousers and shirts are both normal goods, then the consumer will buy more of both goods. This would be the income effect of the price change. Let us assume that, after I.E., the consumptions levels now are:

Shirts = 2+4 = 6 units of shirts.
Trousers = 8+1 = 9 units of trousers.

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As the price effect is the sum of I.E. and S.E., the change in the consumption of trousers from 6 units to 9 units is the total price effect. We can summarize our examples and discussions in the following table:
When P_T falls from \$3 to \$2:

S.E.	I.E.	P.E. = S.E. + I.E.
Q_T rises 6_T to 9_T	Q_T rises 8_T to 9_T	Q_T rises 6_T to 9_T

However, if trousers are inferior goods (for which demand falls when the consumer's real income rises), their income effect would work in the opposite direction: When his or her real income rises due to a reduction in the price of trousers, he or she will buy fewer trousers. In that case:

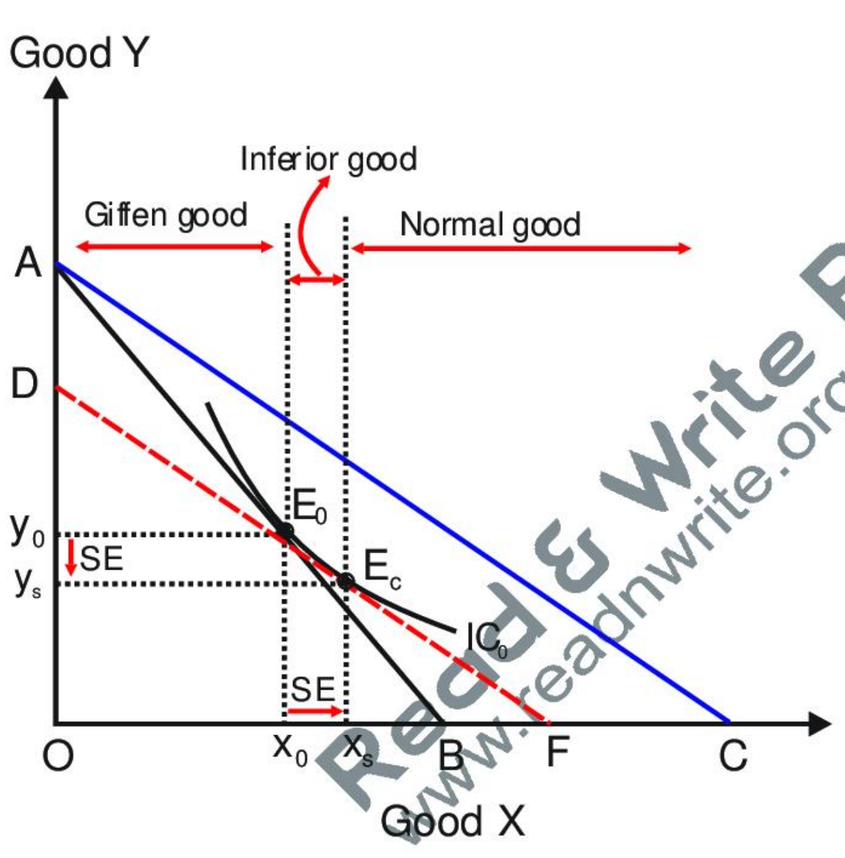
Trousers = 8−1= 7 units of trousers.
Shirts = 2 + 8 = 10 units of shirts.

Summarizing S.E., I.E., and P.E. of inferior goods.

S.E	I.E	Relative strength of direction of S.E and I.E	P.E = S.E + I.E
Q_T rises 6_T to 8_T	Q_T falls 8_T to 7_T	S.E.> I.E.	Q_T rises 6_T to 7_T

Similarly, if the price of trousers rises, Q_T would fall according to S.E. in both normal and inferior goods; but, according to I.E., Q_T would fall in normal and rise in inferior goods (as real income falls with the increase in the price of trousers).

Graphical Explanation:
The initial consumer equilibrium is at E_0, where IC_0 is tangent to initial budget line AB. AtE_0, the consumer will consume quantities Ox_0 and Oy_0 of goods x and y, respectively. A reduction in the price of good x will cause the budget line to shift from AB to AC, pivoting it outwards along the x-axis. As a result of the price decrease, there will be two effects on consumer choice: (1) the substitution effect (S.E.) and (2) the income effect (I.E.). Good x is relatively cheaper now, so, according to the substitution effect, the consumer wills witch over consumption from good y to good x instead—buying less of good y (for it is now relatively more expensive) and more of good x. On the other hand, the reduction in price will raise the real income of the consumer, causing him or her to increase or decrease consumption, depending on whether the goods in question are normal goods or inferior goods. In order to segregate the two components of the price effect (P.E.), we draw a compensating budget line, DF, which will be parallel to AC and tangent to IC_0. By being parallel to AC, the compensating budget line eliminates the effect of a rise in real income due to a reduction in the price of good x. By being tangent to IC_0, the compensating budget line is used to pinpoint the exact combination of goods which provides the same total utility. Through this, we can determine the change in consumption levels which resulted solely due to the substitution effect. As can be observed in the diagram below, the substitution effect is the change in consumption of good x from x_0 to x_s and of good y from y_0 to y_s.



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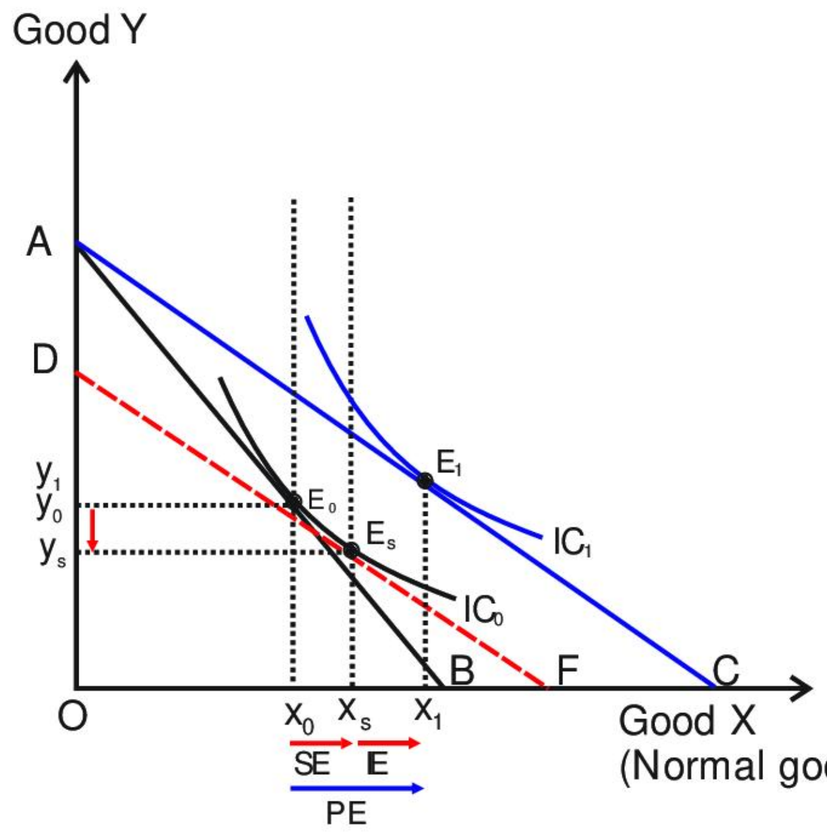
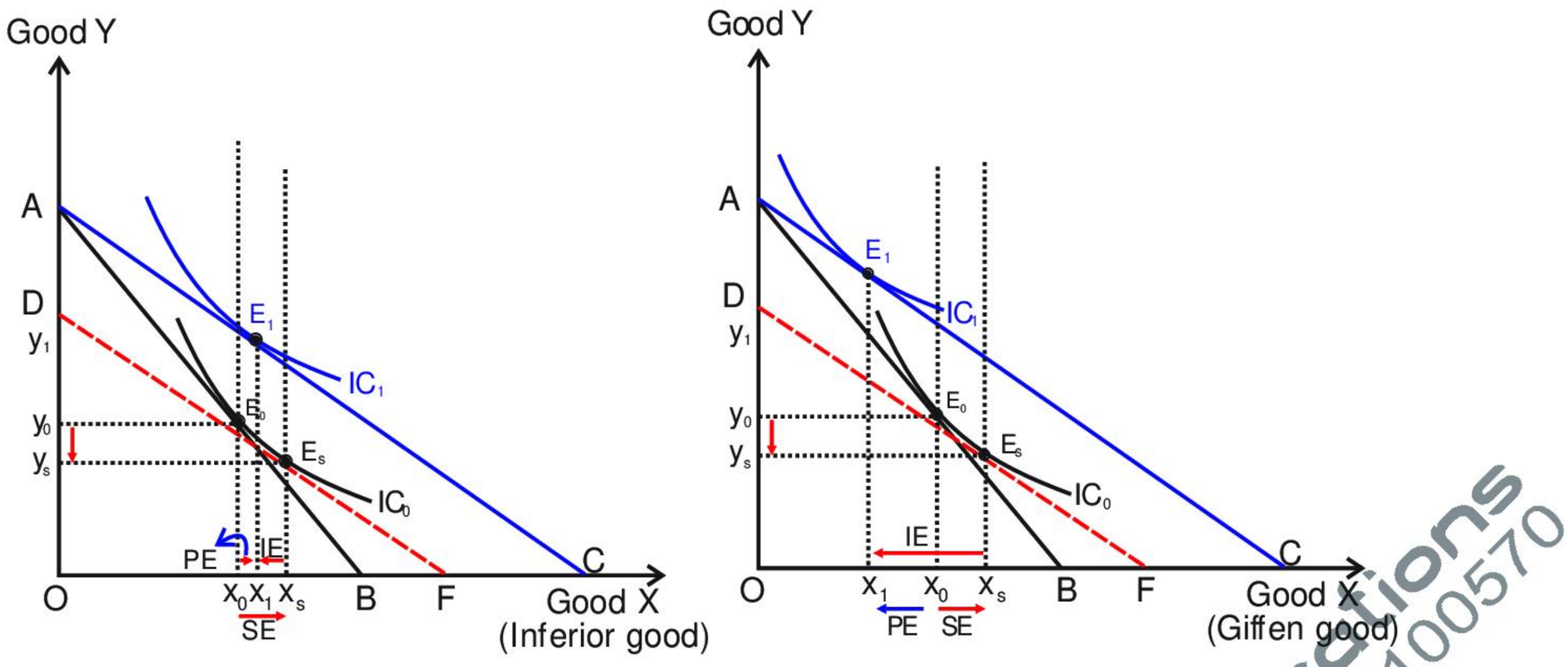
To determine the income and price effects, we will have to draw indifference curve IC_1, which will be tangent to budget line AC. If the tangency of IC_1 to AC establishes a quantity of good x that is greater than x_s, then good x is a normal good—since an increase in real income led to an increase in the consumption of good x. This is shown in the following diagram below.



On the other hand, if the tangency of IC_1 to AC establishes a quantity of good x that is lesser than x_s, then good x is an inferior or Giffin good, as shown in the diagrams below.



A good is said to be inferior if substitution effect (SE) is greater than income effect (IE). In case of Giffen goods, income effect (IE) is greater than substitution effect (SE).

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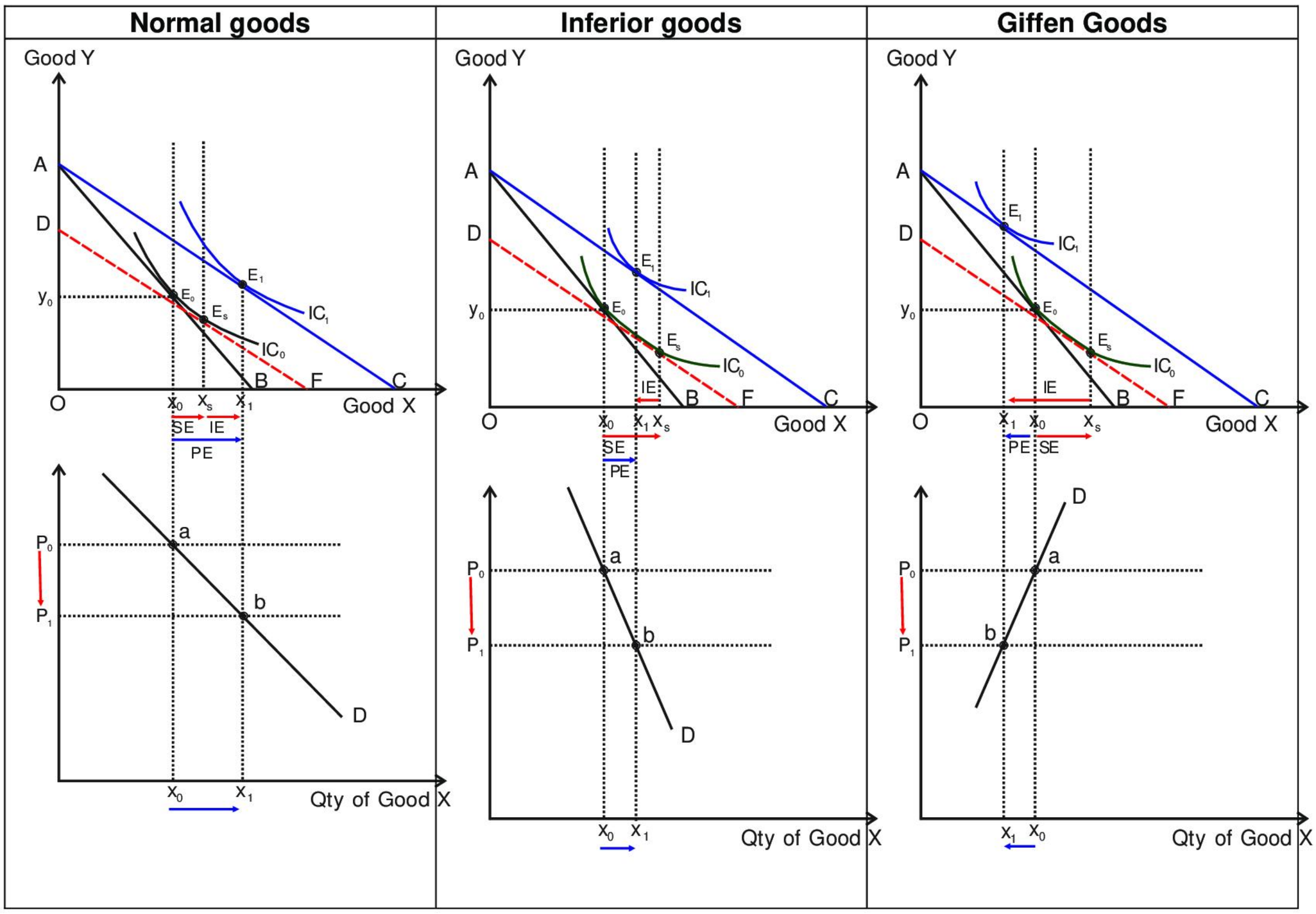
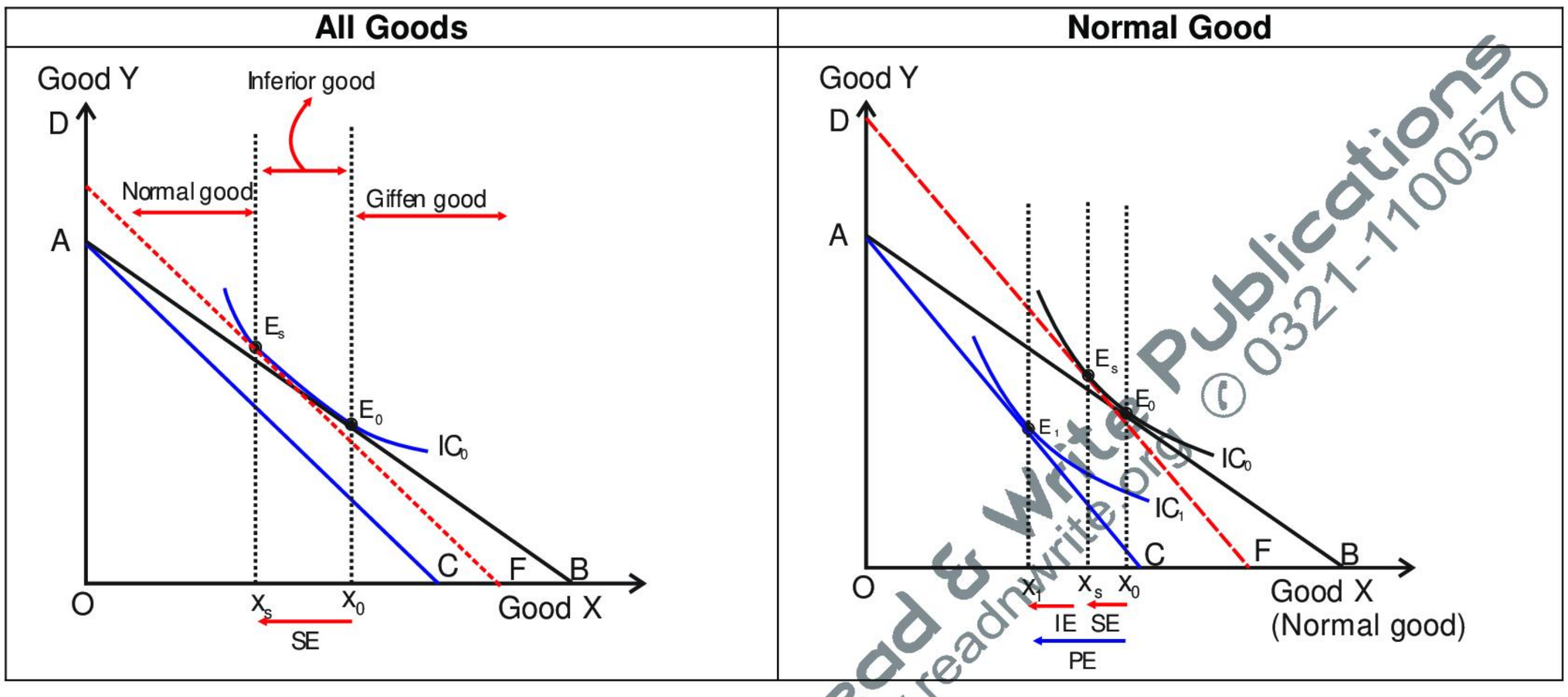
Derivation of demand curve from indifference curve analysis



Effect of increase in price of good x on SE and IE and types of goods



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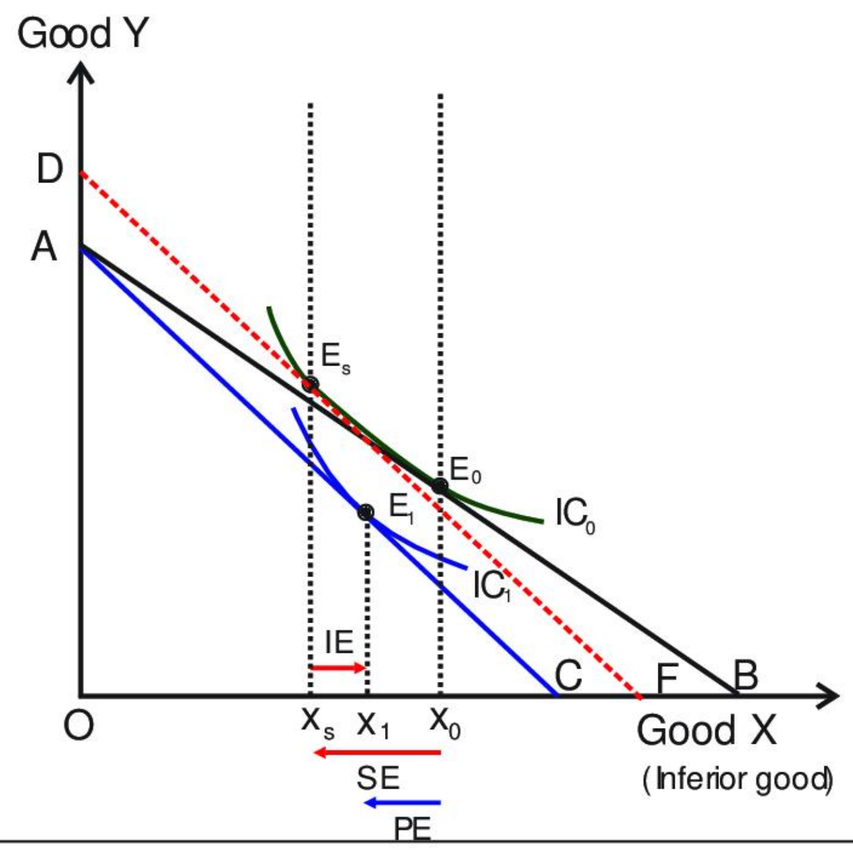
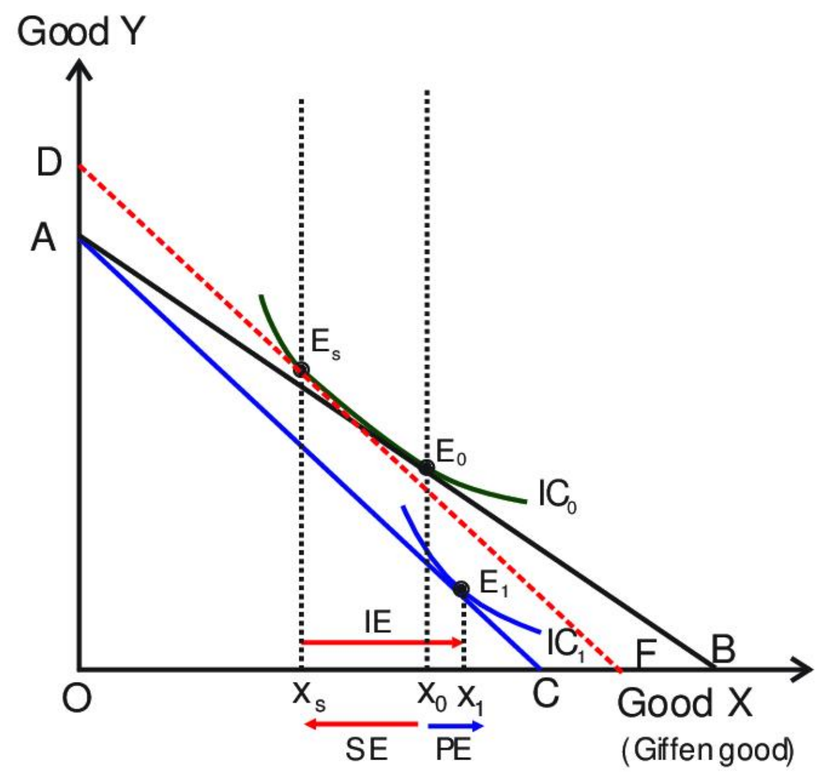
Inferior Good	Giffen Good
	

Reasons for the Downward Slope of the Demand Curve:

i. The effect of new buyers
ii. S.E.
iii. I.E.
iv. The law of diminishing utility

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PAST PAPER QUESTIONS

Utility Theory & Consumer Equilibrium

(Nov 2014/P43/Q2)

The link between marginal utility and price has a similar significance for the consumer as the link between marginal cost and price for the producer.
Consider whether this statement is an accurate reflection of the economic analysis of consumer and producer equilibrium. [25]

(Nov 2014/P42/Q2)

'The purchases a consumer makes are based upon marginal utility. It is this alone that determines market equilibrium in perfect competition. Supply has no relevance.'
Is this true? [25]

(November 2013/P41/Q2/a)

Explain how economic analysis suggests that consumers make a choice when buying products and how they react to price changes.[12]

(Nov 2012/P42/Q2/a)

A study found that demand for tickets for exhibitions at a major art gallery had unitary price elasticity.
Explain how the concept of diminishing marginal utility may be used to construct a demand curve for the product and whether that analysis still applies in the case of demand for tickets for the exhibitions. [12]

(Nov 2012/P41/Q2/a)

Explain how the law of diminishing marginal utility might be used to construct a consumer's demand curve for a product. [12]

(Nov 2011/P42/Q2/a)

Explain the link between a consumer's expenditure and the equi-marginal principle of utility.[12]

(June 2011/P42/Q3/b)

Analyse what is meant by the equi-marginal principle of consumer demand and whether it can be linked to the derivation of a market demand curve. [13]

(June 2010/P42/Q5)

Economic theory emphasises the idea of an equilibrium position. Discuss whether the idea of an equilibrium is a useful and practical way of explaining the behaviour of a consumer. [25]

(Nov 2007/P4/Q2/a)

'We do not ask consumers what they want. They don't know. We decide what they will need and will want.' Akio Morita, founder of the Sony electronics company.
Explain how, according to utility theory, consumers allocate their expenditure between different products as prices change. [12]

(Nov 2006/P4/Q3/a)

My higher income will make me happier in the short run. In the long run I will become accustomed to it and my happiness will return to the previous level. There is no point, therefore, in earning higher income.

Explain the Law of Diminishing Marginal Utility and discuss whether it supports the idea that higher incomes increase happiness. [12]

(June 2006/P4/Q3/a)

The gain in happiness when someone gets an extra dollar is much smaller when the person is rich than if they are poor. So money transferred from rich to poor raises total happiness and governments should seek to make such transfers.
Explain what is meant by the Law of Diminishing Marginal Utility and consider whether the statement above is a correct application of it. [12]

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(June 2004/P2/Q2/b)

Discuss whether marginal utility theory is a realistic piece of economic analysis in explaining consumer demand. [13]

Rational Behavior Of Consumers

(June 2014/P41/Q3), (June 2014/P43/Q3)

A consumer's demand is sometimes influenced by advertising and sometimes influenced by impulse buying. This means that the economic theories of consumer demand based on utility are of no relevance to a firm trying to determine its likely revenue.
Do you agree with this argument? [25]

(June 2014/P42/Q2)

'The analysis of marginal utility as an explanation of consumer equilibrium can only be related to the purchase of one good, cannot be used if incomes increase, and is not applicable if advertising causes a change in tastes. It is, in practice, not a useful guide to consumer behaviour'.
Assess this opinion. [25]

(June 2010/P41/Q7)

Economic analysis adequately explains how a rational consumer determines a pattern of consumption from a given income in a perfect market with no advertising. It does not explain the more common case of what happens if income changes or if there is advertising. The theory is, therefore, of little merit. Do you agree with these assertions? [25]

(Nov 2008/P4/Q2)

Economic analysis of resource allocation assumes consumers are rational. Where advertising exists, this analysis is of little value. Do you agree with this argument? [25]

(June 2002/P4/Q2)

'The demand for goods and services is often influenced by advertising or involves choices based on impulse.This means that the economic theory of demand is irrelevant. Discuss whether you agree with this argument.
[25]

Budget Line

(Nov 2014/P41/Q2/a)

Analyse whether there is a difference between:

- the way the effects of an increase in price can be represented using a budget line, and
- the way the effects of an increase in price can be represented using a demand curve based on marginal utility theory. [12]

(Nov 2012/P41/Q2/b)

Analyse how budget lines may be used to illustrate what happens for both a normal good and an inferior good when the price of the good increases at the same time as a consumer's income increases. [13]

(June 2011/P42/Q3/a)

Discuss whether demand schedules and budget line diagrams are similar in the way they represent the effect of
(i) a rise in the price of a good
(ii) a rise in a consumer's income. [12]

Income effect (I.E.) & substitution effect (S.E.)

(June 2004/P2/Q2/a)

Explain what is meant by the income and substitution effects of a price change and discuss why these might be different for different types of goods. [12]

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UNIT 2

Production and Cost

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Short-run production function:

- fixed and variable factors of production
- total product, average product and marginal product
- law of diminishing returns (law of variable proportions)
- marginal cost and average cost
- short-run cost function – fixed costs versus variable costs
- explanation of shape of Short-Run Average Cost (SRAC)

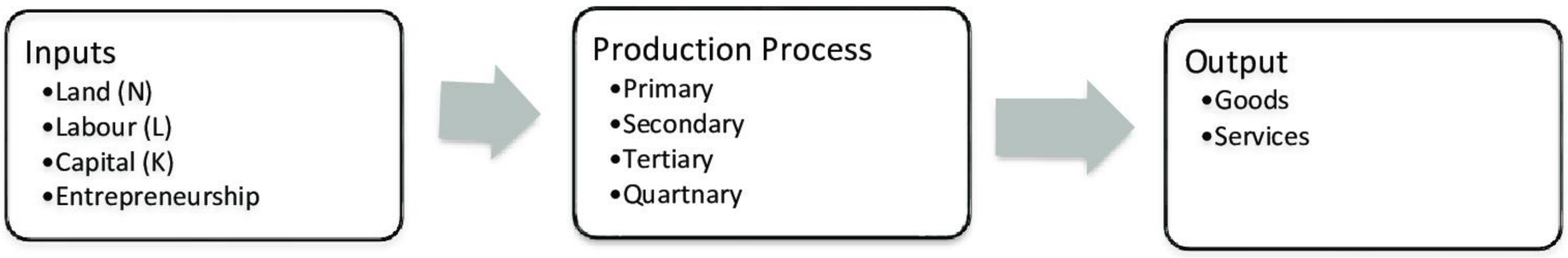
b. Long-run production function

- returns to scale
- long-run cost function
- explanation of shape of Long-Run Average Cost (LRAC)
- relationship between economies of scale and decreasing costs
- internal and external economies of scale and diseconomies of scale

Unit 2 Production And Cost

Production process:

It is the act of combing factors of production (land, labour, and capital, etc.) by firms to produce output in the form of goods and services.



It can also be defined as:

It is the process of extracting raw-materials, converting them into finished goods, and finally distributing them to consumers.

According to the three-sector hypothesis, the economy is divided into three sectors (or industries), each of which represents a stage of the production process (as defined above). These sectors are:

- **The primary industry**: involves the extraction of raw-materials, e.g., farming, fishing, mining, etc. Primary industries rely heavily on natural resources and form a major part of a less developed country. Economies of less developed countries (LDCs) are primarily dependent on their natural resources, .e.g., Pakistan's economy is mainly dependent on its agricultural sector.
- **The secondary industry**: depends on the raw materials provided by the primary industry, and converts them into finished goods; examples of the secondary industry in action include canning foods, manufacturing cars, refining oil, etc. These goods are then ready for consumption by buyers. LDCs have a poorly developed secondary sector due to the lack of capital and technology necessary for industrialization.
- **The tertiary industry**: provides services. Some of these services are bought by consumers and others are used to further help sell goods. Examples of tertiary services include: wholesaling, retailing, advertising, transport, banking, insurance, communication, etc. Tertiary industries form a major proportion of a developed country's total output.

Less Developed Countries (LDCs):
The proportion of an industry's output to GDP (the entire country's output) is as follows:

Primary industries > Secondary industries > Tertiary industries

Developed Countries (DCs):
The proportion of an industry's output to GDP (the entire country's output) is as follows:

Tertiary industries > Secondary industries > Primary industries

Production and time:

There are three types of time periods in microeconomic studies. They are:

- The momentary time period
- Short run (SR)
- Long run (LR)
- Very long run

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1. **The Momentary Time Period:**
   A time period during which a firm is unable to alter any of its factors of production in response to changes in the demand and price of the product.
   During the momentary time period, supply is fixed and perfectly inelastic.

2. **Short Run (SR):**
   A time period during which at least one factor of production is fixed.
   In the short run, labour is usually the variable factor and capital and land are fixed factors.
   a. Variable factor:
      A factor of production which varies in the short run—e.g., labour, raw-material, etc.
   b. Fixed factor:
      A factor of production which does not vary in the short run—e.g., buildings, machine, land, etc.

3. **Long Run (LR)**
   A time period during which a firm is able to change all factors of production, but its factor proportions remain constant as there is no change in production techniques.

4. **Very Long Run**
   A time period during which there is a change in factor proportions as well, due to changes in technology and production techniques.

How short is the short run and how long is the long run?

The short run and long run must not be confused with time periods measured in hours, days, months, or years. The short run does not mean a short time-period of a few days or months. The short run might be years or decades long, depending on the nature of the production process. For example, a tailoring shop might take a few months to change all of its factors of production, but an oil refinery will be able to change all of its factors of production in twenty years. Until it is able to change all of its factors of production, it is still operating in the short run.

Production function:

The relationship between inputs and outputs is known as the production function. This relationship may exist in the short run and the long run.

1. **The Long-run Production Function:**
   The relationship between all inputs (i.e., land, labour, and capital) and output is known as the long-run production function, and it is assumed that all inputs are variable.

$$Q = f (L, N, K, Tech)$$

   Where L = Labour; N = Land; K = Capital; and, Tech = Technology

2. **The Short-run Production Function:**
   The relationship between the variable factor (such as labour) and output when all other factors (such as land and capital) are kept constant.

$$Q = f (L)$$

The short-run production function can be explained by the “law of diminishing returns to a variable factor” (or the “law of variable proportions”).

The law of diminishing returns (Law of variable proportions):

“As we keep on increasing the variable factor (labour), the marginal product (MP) and average product (AP) may rise initially, but eventually diminish.”

To explain the law of diminishing returns to a variable factor, we must first explain marginal Product (MP), average product (AP), and total product (TP).

a. **Total Product (TP)**
   The total amount of goods and services produced by a given level of factor inputs.

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$$TP = MP_1 + MP_2 + MP_3 + \ldots\ldots\ldots = \sum MP$$

b. Marginal Product (MP)

The change in total product due to a unit change in labor employed.

$$\text{Marginal Product} = \frac{\text{Change in total product}}{\text{Change in labour}} = MP = \frac{\Delta TP}{\Delta L}$$

Suppose:

$L_1 = 5$ $TP_1 = 100$ units $\Delta TP = TP_2 - TP_1 = 120 - 100 = 20$

$L_2 = 6$ $TP_2 = 120$ units $\Delta L = L_2 - L_1 = 6 - 5 = 1$

Therefore:

$$MP = \frac{\Delta TP}{\Delta L} = \frac{120-100}{6-5} = 20 \text{ units}$$

c. Average Product (AP)

The total product divided by the total number of units of labour employed.

$$\text{Average Product} = \frac{\text{Total product}}{\text{labour}} = AP = \frac{TP}{L}$$

Traditional economic theory assumes that firms use only two factors—labour and capital—to produce output. Furthermore, it assumes that firms can only increase output in the short run by adding extra units of labour to a fixed number of machines.

As illustrated in the table and diagram below, when more and more variable factors are added to a given fixed factor, the total product will initially increase at an increasing rate. Each extra worker is able to produce more than the previous worker because, at first, marginal workers have easy access to a fixed number of machines and the principle of division of labour can be applied.(Division of labour is achieved when the whole production process is divided into several individual tasks and each task is carried out by a single worker.)The benefits of division of labour include: saving time, a more efficient use of tools and equipment, greater skills, etc. Hence, the firm is initially obtaining increasing returns (as shown by a rising MP in the diagram below). According to the following diagram, there will be increasing returns till the 3rd unit of labour.

Units of Labour	Capital (K)	Marginal Product (MP)	Total Product (TP)	Average Product (AP)	Returns	Reason
0	3	–	0	–	Increasing returns	Division of labour
1	3	10	10	10		
2	3	14	24	12		
3	3	16	40	13.3		
4	3	8	48	12	Decreasing / Diminishing returns	Exhaustion of fixed factor
5	3	2	50	10		
6	3	0	50	8.3		
7	3	−4	46	6.5	Negative returns	
8	3	−10	36	4.5		

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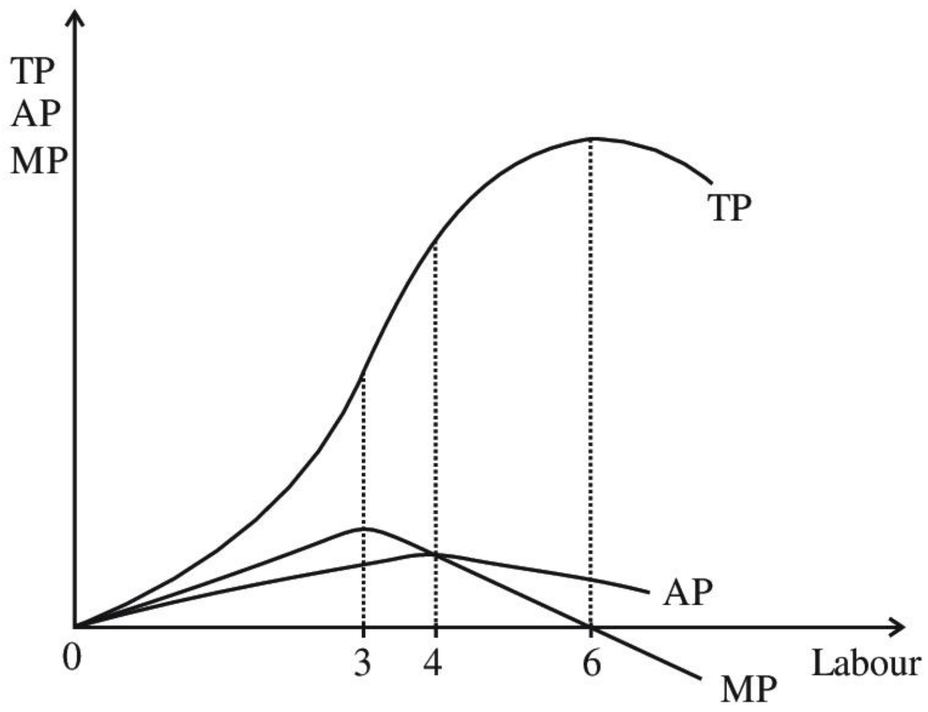
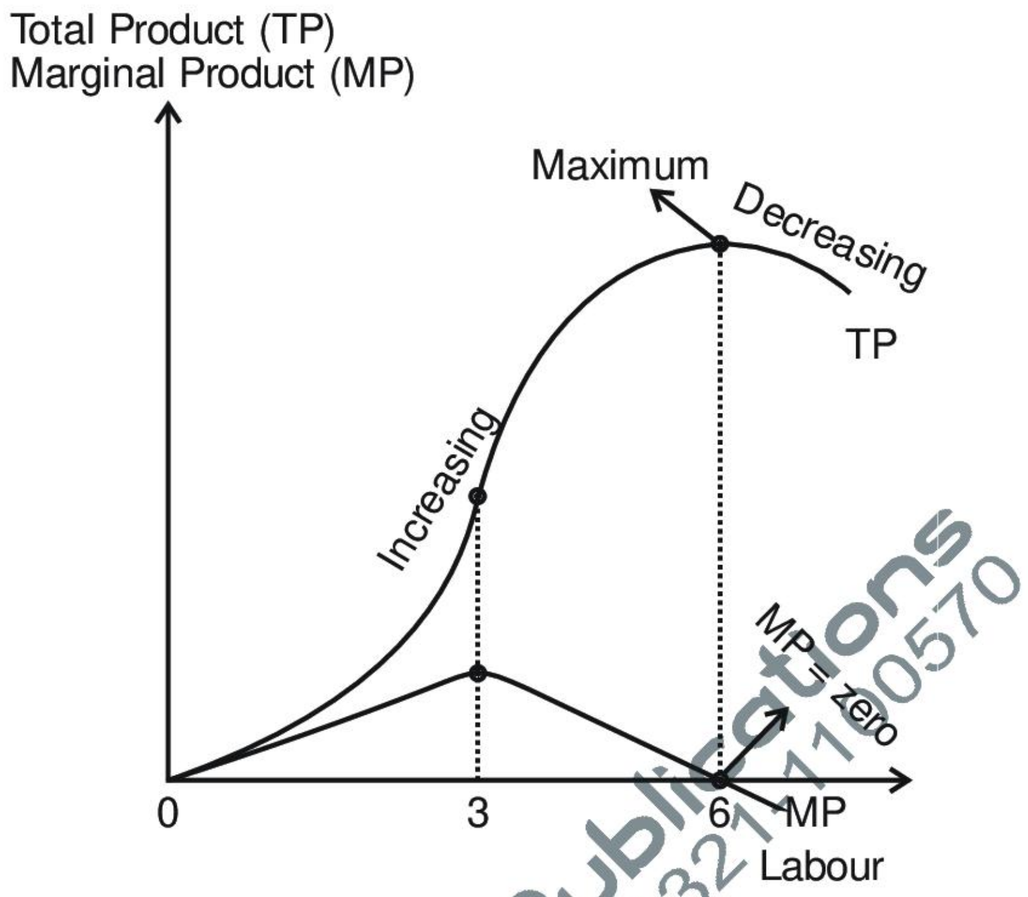


However, if the number of variable factors keeps increasing beyond 3, total product begins to increase at a decreasing rate, and marginal product begins to fall—i.e., diminishing returns set in with the exhaustion of the fixed factor. Workers experience a delayed access to machines and the opportunities for division of labour have been fully exploited. When too much labour is combined with the same capital, MP becomes negative on the 7th unit and total product starts falling.

It is evident from the above diagram that an increase in labour coupled with a fixed factor causes MP and AP to initially rise but eventually fall.

Relationship between MP and TP:

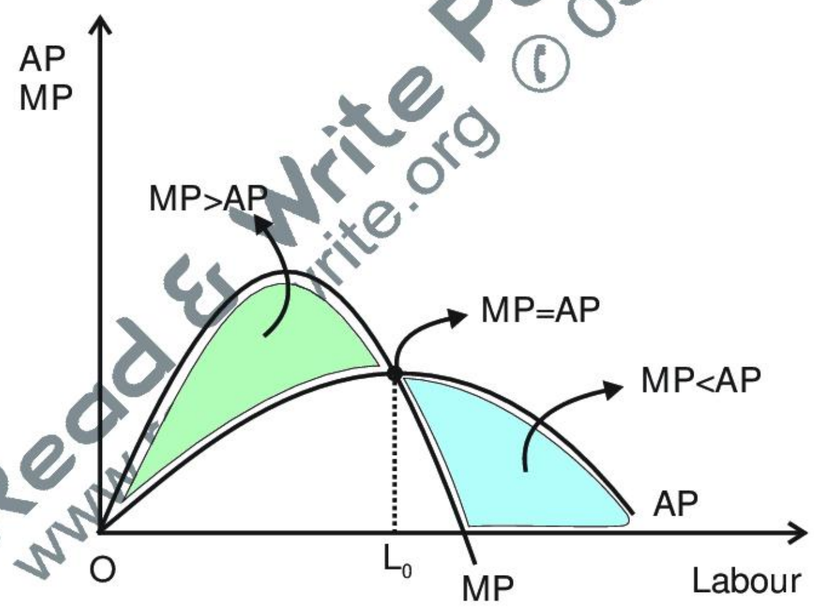
MP	TP
Positive	Increases
Zero	Maximum
Negative	Decreases



Relationship between MP and AP:

When	AP
MP> AP	Increases
MP=AP	Maximum
MP<AP	Decreases

NOTE: The MP curve always intersects the AP curve at its maximum point (turning point).



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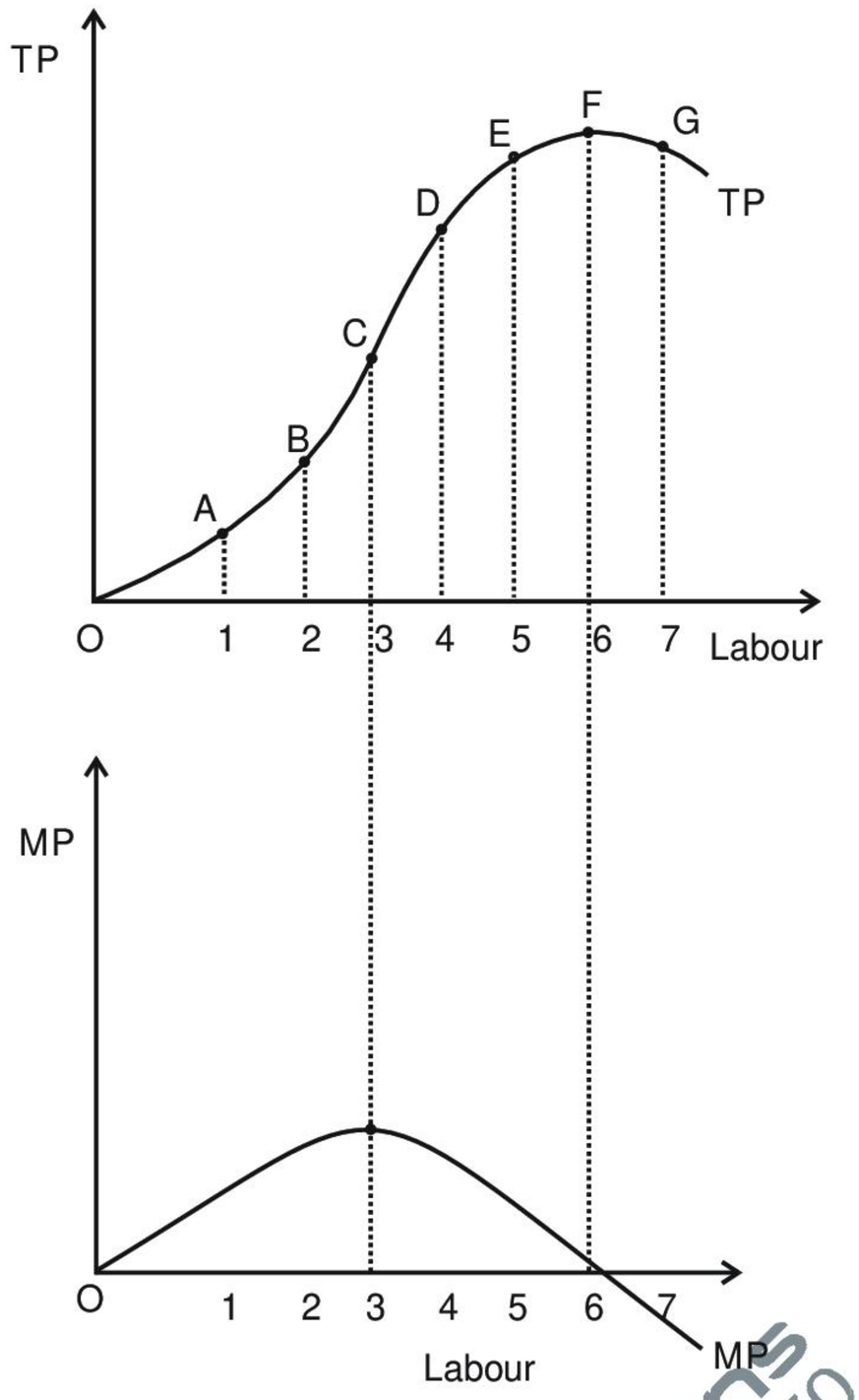
Derivation of marginal and average product curves from total product curve:

1. Derivation of marginal product (MP) from total product (TP):

Mathematicians derive the "marginal value" from the total value curve by drawing tangents to the total curve. Let's consider the total product (TP) curve and discuss how marginal product (MP) can be derived from TP graphically.

- Take different points A, B, C, D, E, F, and G on the TP curve.
- Draw tangents to each point.
- Note the gradient at each point.
- The gradient of the TP curve will determine the value of MP.
- According to the above diagram, the gradient of TP continues to rise up till 3 units of labour are employed at point C. Then, it starts falling and reaches zero at point F, when 6 units of labour are employed. After the 6th unit of labour, the gradient is negative.
- As per definition, MP is the gradient of TP; therefore, MP will raise up to 3 units of labour. Then, it starts falling but continues to stay positive up to the 6th unit of labour employed. At the 6th unit, MP is zero, and then after the 6th unit, MP goes into negative.



Conclusion

- As long as the total product curve is rising with an increasing rate, its marginal product curve is rising and positive.
- When the total product curve is rising with a decreasing rate, its marginal product curve is falling, but continues to stay positive.
- When the total product curve is at its maximum, its marginal product reaches zero.
- When the total product curve is falling, its corresponding marginal product is negative.

2. Derivation of average product (AP) from total product (TP):

Economists and mathematicians use 'rays from origin' to derive an average product curve from given total product curve.

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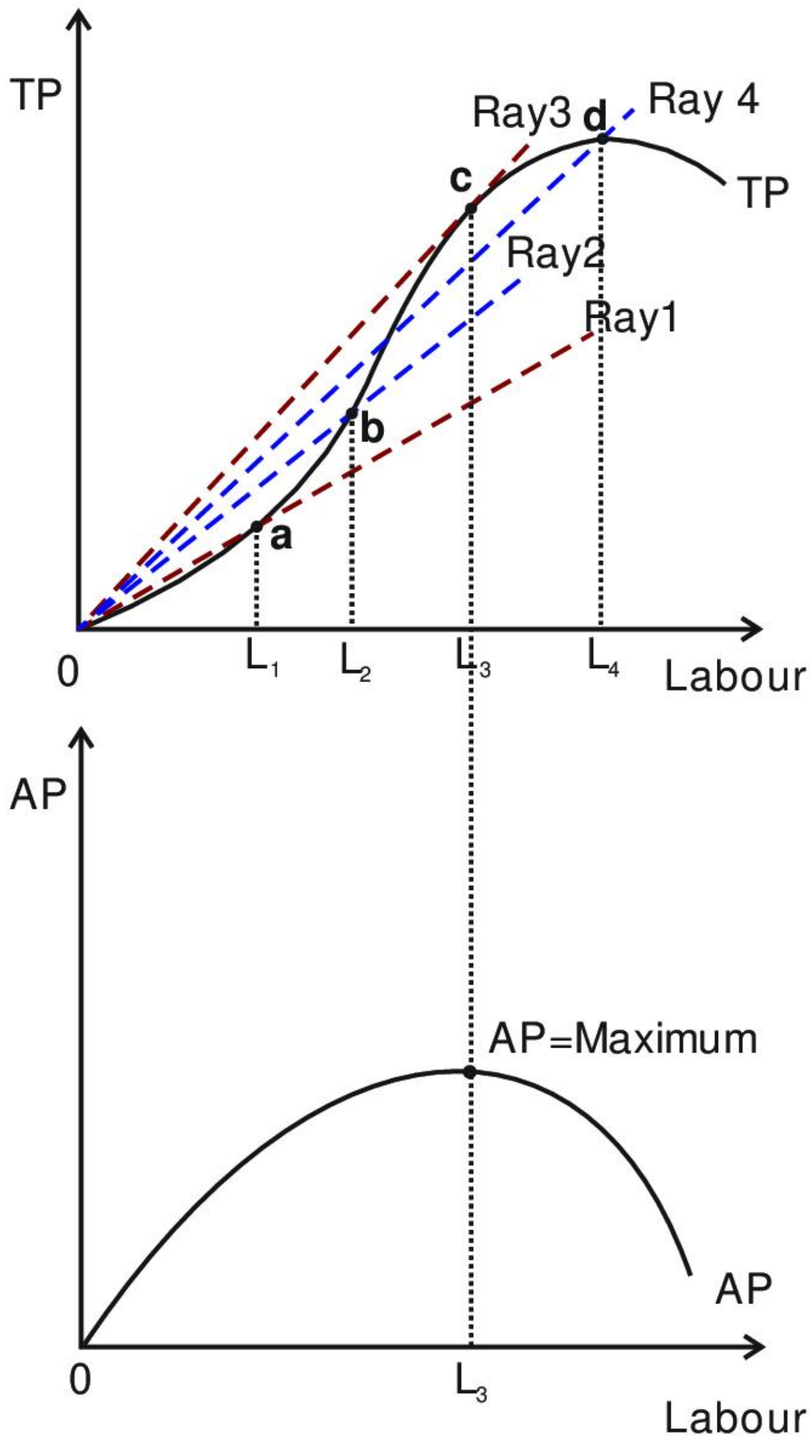
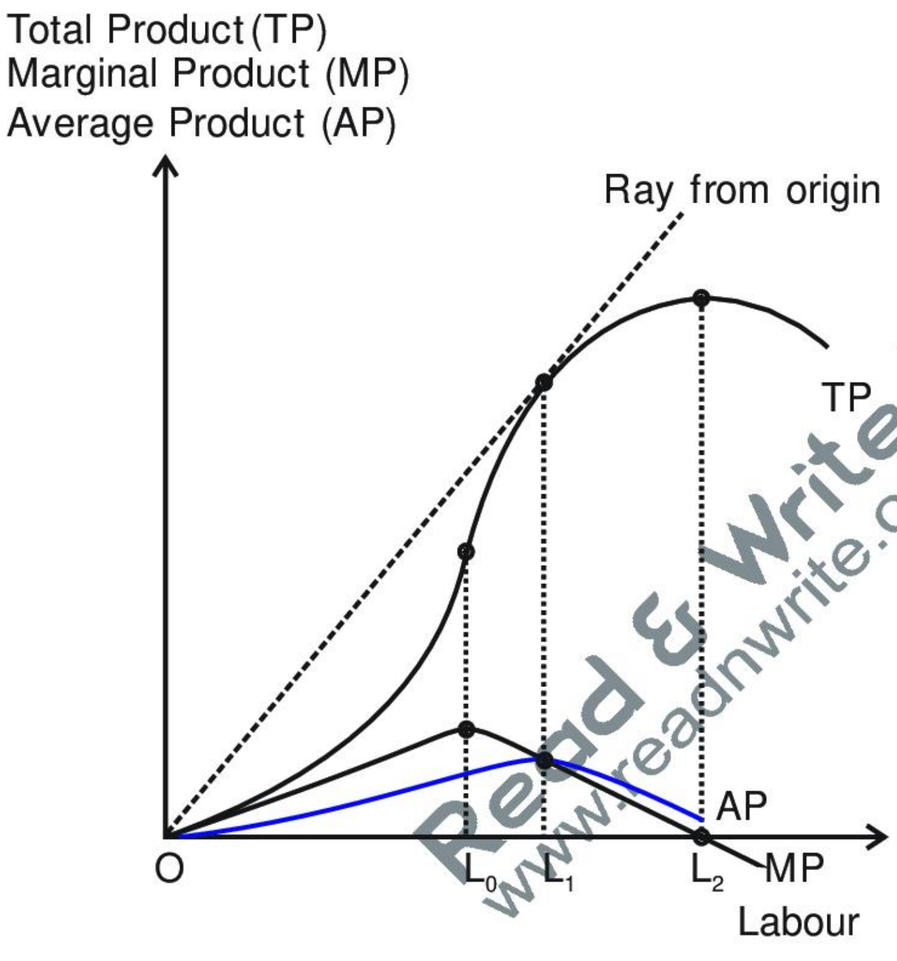
- Take different points a, b, c, d etc on TP curve.
- Draw rays from origin and pass them through points a, b, c, and d respectively.
- Now draw perpendiculars from these points to x-axis.
- Label them L_1, L_2, L_3 and L_4
- Extend them to lower diagram .i.e. AP curve diagram
- Now consider first ray 'Ray 1' passing through point 'a' on TP curve.
- There is a triangle 'OaL_1'
- Mathematically
  $\frac{aL_1}{oL_1} = \frac{\text{Perpendicular}}{\text{Base}}$ = Gradient of Ray 1
- And as we know AP=TP/L, here at point 'a', TP = aL_1 and L = OL_1.Therefore gradient of ray1 will indicate the value of AP .i.e. AP_1 at point 'a'.
- Hence we can infer that gradient of a ray originating from zero will determine the value of AP at respective point on TP curve.
- Initially, as we increase labour from L_1 to L_2 and then L_3, gradient of rays from origin is rising, therefore corresponding to AP curve will rise up to L_3 in the lower diagram.
- At labour L_3, ray originating from zero becomes tangent to TP curve. It will be turning point of AP and value of AP would be maximum at L_3.
- Increase in employment of labour beyond L_3 .e.g. L_4, will reduce to gradient of rays .e.g. gradient of Ray 4 is less than of Ray 3. Value of AP will start falling.



Summary:

Following diagram shows relationship between MP, AP, and TP. According to following diagram, MP starts falling first then AP and finally TP.



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Least-cost inputs combination in the long run:

In the long run all factors of production are variable. Therefore, in the long run, a firm can choose that factor input mix (i.e., combinations of land, labour, and capital) which is most efficient (i.e., incurs the least cost).

Suppose, given some marginal products of labour and capital, if the price of capital falls, firms will change their initial factor input mix and will employ more of capital instead of labour. The right combination of land, labour, and capital can be found by equating the ratios of the MP of each factor to its respective price. This is known as the **law of technical substitution**:

$$\frac{MP_L}{P_L} = \frac{MP_K}{P_K} = \frac{MP_N}{P_N}$$

Where:

MP_L = Marginal product of labour.
P_L = Price of labour.
MP_K = Marginal product of capital.
P_K = Price of capital.
MP_N = Marginal product of land.
P_N= Price of land.

Suppose:

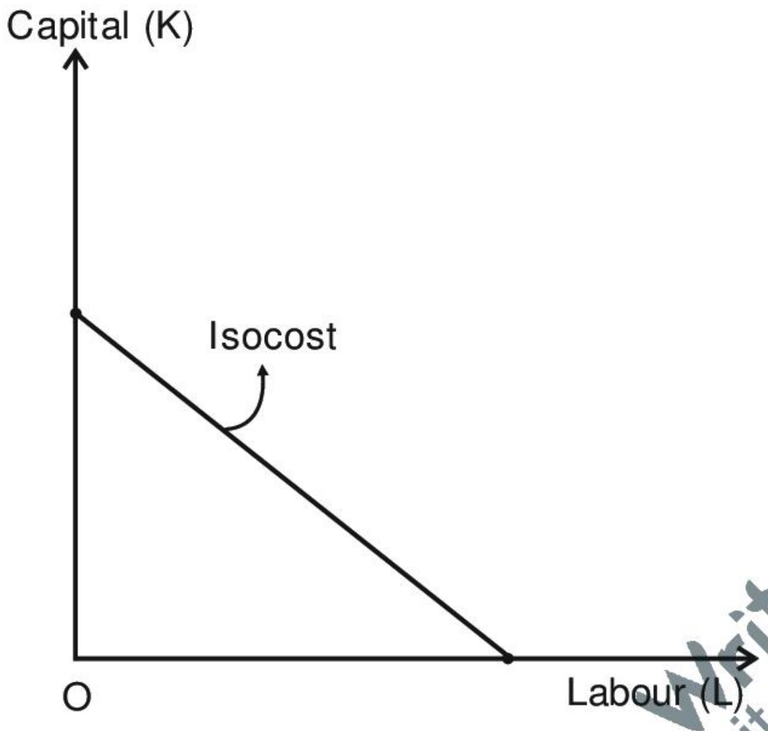
$MP_L = 10$ $M_K = 20$
$P_L = \$1$ $P_K = \$2$

Then each $ spent on either capital or labor will generate same output. But, if the price of capital falls to $1, then spending on capital will generate more output than labour. In the long run, the firm will change the present factor input mix and employ more capital.

Isocost and Isoquant Approach:

Isocost Line:

The isocost line graphically illustrates all possible combinations of two factor inputs which a firm can buy with a given budget constraint and fixed prices of inputs. One isocost represents a total cost for the firm which remains the same for the entire isocost line.



An isocost line may change as the firm's budget or factor prices fluctuate. Suppose there are only two factor inputs: labour (L) and capital (K).The slope of the isocost line represents the price ratios of labour and capital (i.e.,$\frac{\text{wage (w)}}{\text{interest rate (r)}}$ or vice-versa).

Isoquant:

An isoquant is a curve that shows all possible combinations of two factor inputs (labour and capital) for which the total output of the firm remains the same.

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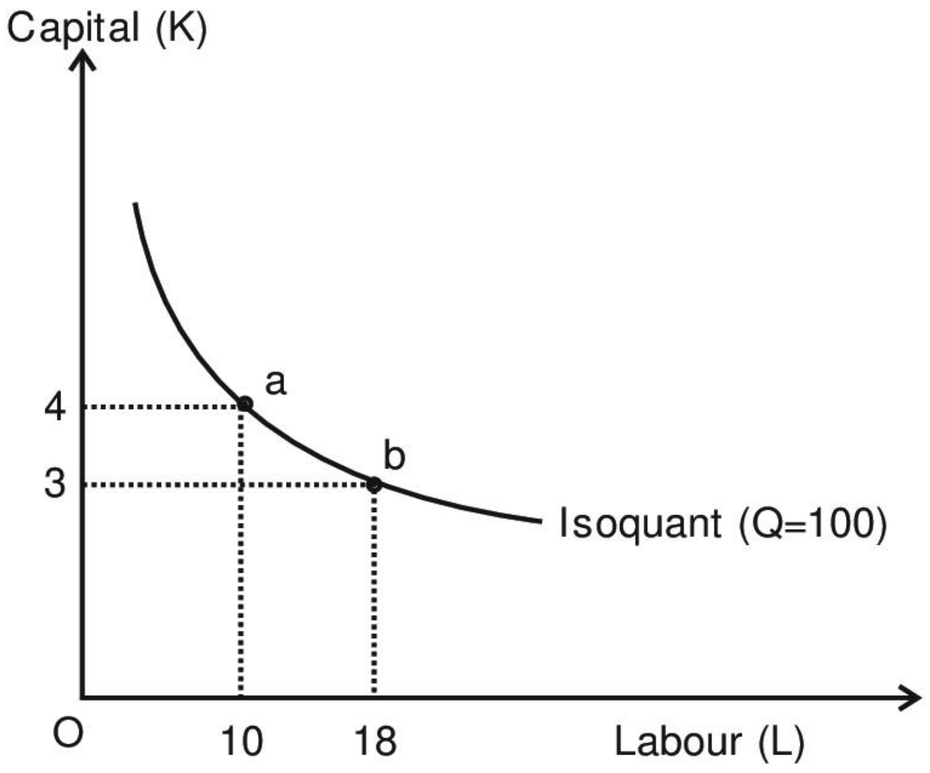
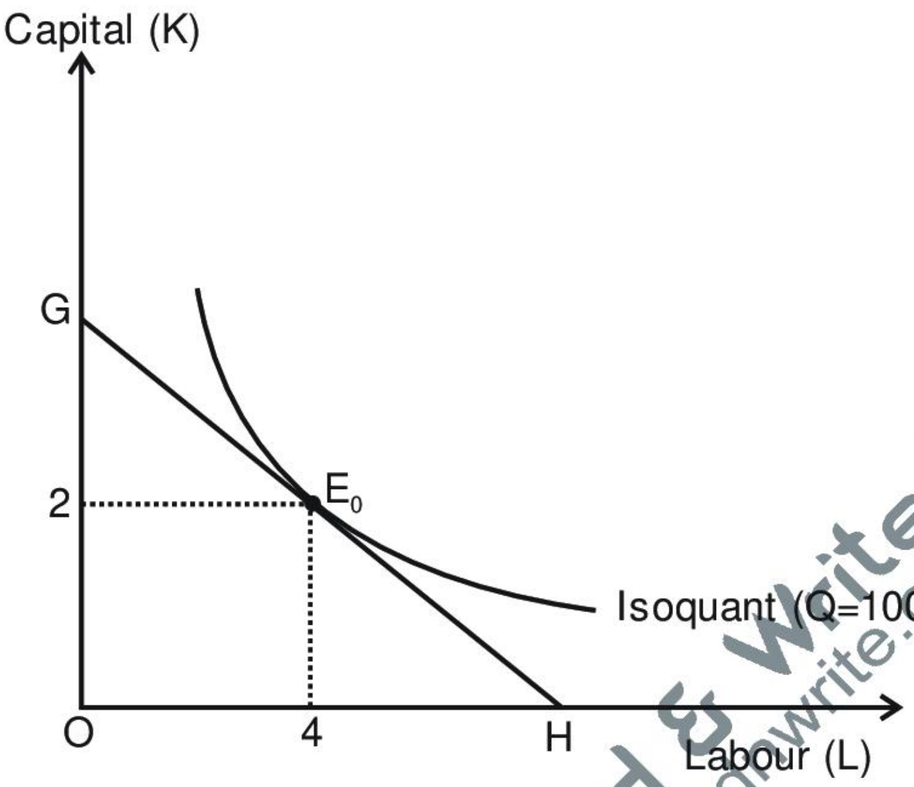


The properties of the isoquant curve include:

1. The slope of this curve is negative: There is some degree of substitution between the two inputs.
2. The curve is convex to origin: The marginal rate of technical substitution of the isoquant is diminishing. Marginal rate of technical substitution (MRTS) in production $=\frac{\Delta K}{\Delta L}=$ the number of units of capital that had to be given up per each unit of labour to maintain the same level of output, along any point on the isoquant curve.
3. A curve farther away from the origin stands for a higher level of output than the one nearer to the origin.
4. As a firm continuously changes its choices, there must be at least one other curve between any two isoquant curves; so, there may be an infinite number of isoquants for a single firm for a combination of factor inputs.
5. No two curves in an isoquant map intersect. It is, therefore, only useful to compare points on the same curve. The marginal rate of technical substitution is only a measure of change along the same curve, not different curves, because different curves represent different levels of output and cannot be compared.



Productive efficiency is achieved where there is least-cost combination of labour and capital for given volume of output. It is shown at point E_0, where isocost line GH is tangent to highest possible isoquant. In other words, this is where the isoquant just touches the lowest possible isocost. Any other point on the isoquant would be on a higher isocost. Hence this combination of factors of production produces given output with least cost and therefore productive efficient.

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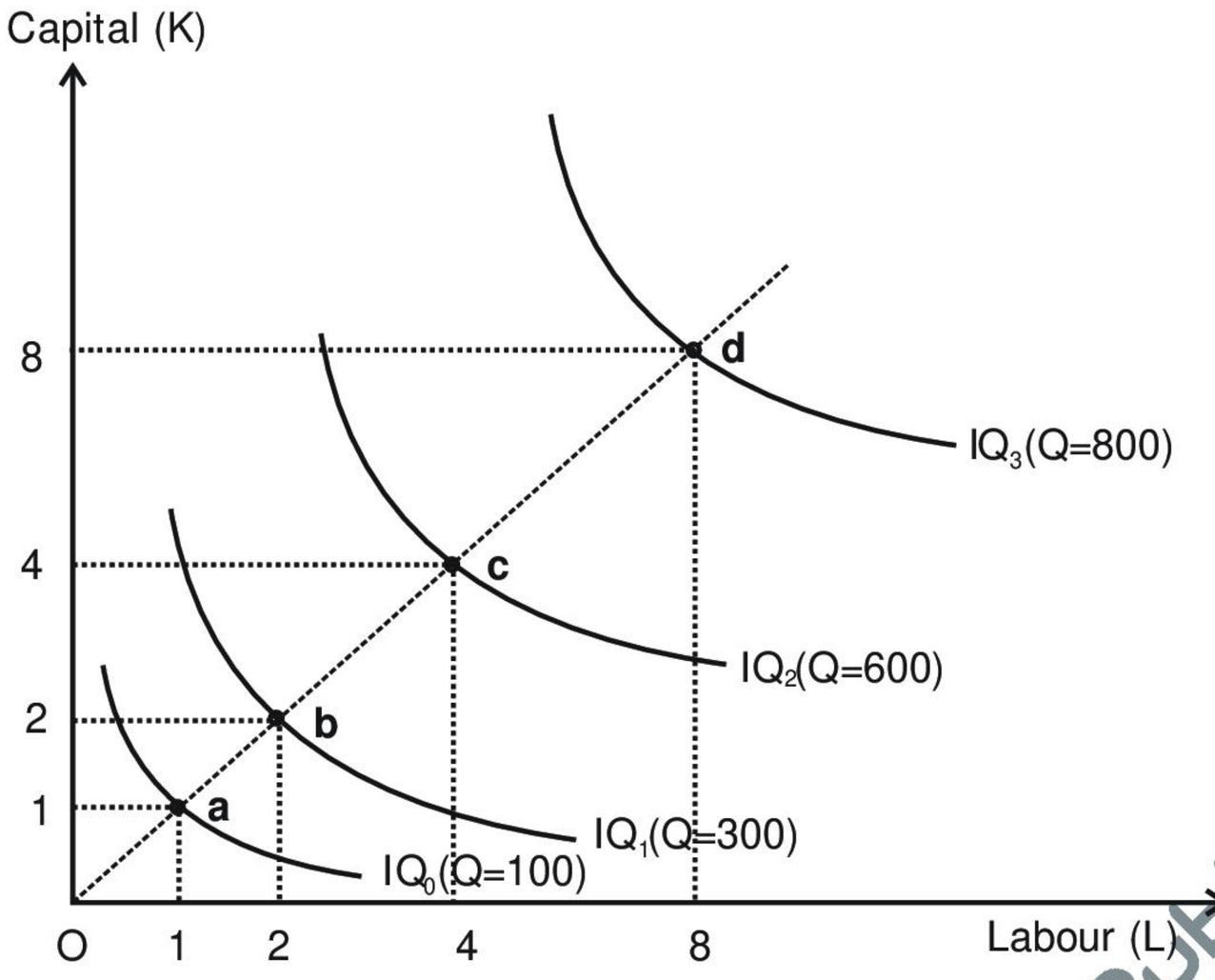
Scale of production and returns to scale:

Scale of production:
The scale of production refers to the level of all inputs (i.e., land, labour, capital, etc.) that a firm is using to produce a given output.
An increase in the scale of production means increasing all inputs used in order to raise the production level. Therefore, a change in the scale of production can only happen in the long run.

Returns to scale:
These are returns a firm receives with an increase in its scale of production.

Returns to variable factor	Returns to scale
Only in the short run	Only in the long run
An increase in output due to an increase in a variable factor (such as labour)	An increase in output due to an increase in all inputs (i.e., land, labour, capital, etc.)
May be diminishing, constant, or increasing	May be diminishing, constant, or increasing
Due to a fixed factor and the law of diminishing returns	Due to economies or diseconomies of scale

Law of returns to scale:
When a firm increases all of its inputs by x%, output may rise by more than x% (increasing returns to scale), equal to x% (constant returns to scale), or less than x% (diminishing returns to scale).



L_1	K_1	L_2	K_2	Q_1	Q_2	%Δ all inputs	%Δ in output	Returns to scale (RTS)	Isoquant	In diagram
1	1	2	2	100	300	100%	200%	Increasing returns to scale	IQ_0 to IQ_1	From “a” to “b”
2	2	4	4	300	600	100%	100%	Constant returns to scale	IQ_1 to IQ_2	From “b” to “c”
4	4	8	8	600	800	100%	33%	Diminishing returns to scale	IQ_2 to IQ_3	From “c” to “d”

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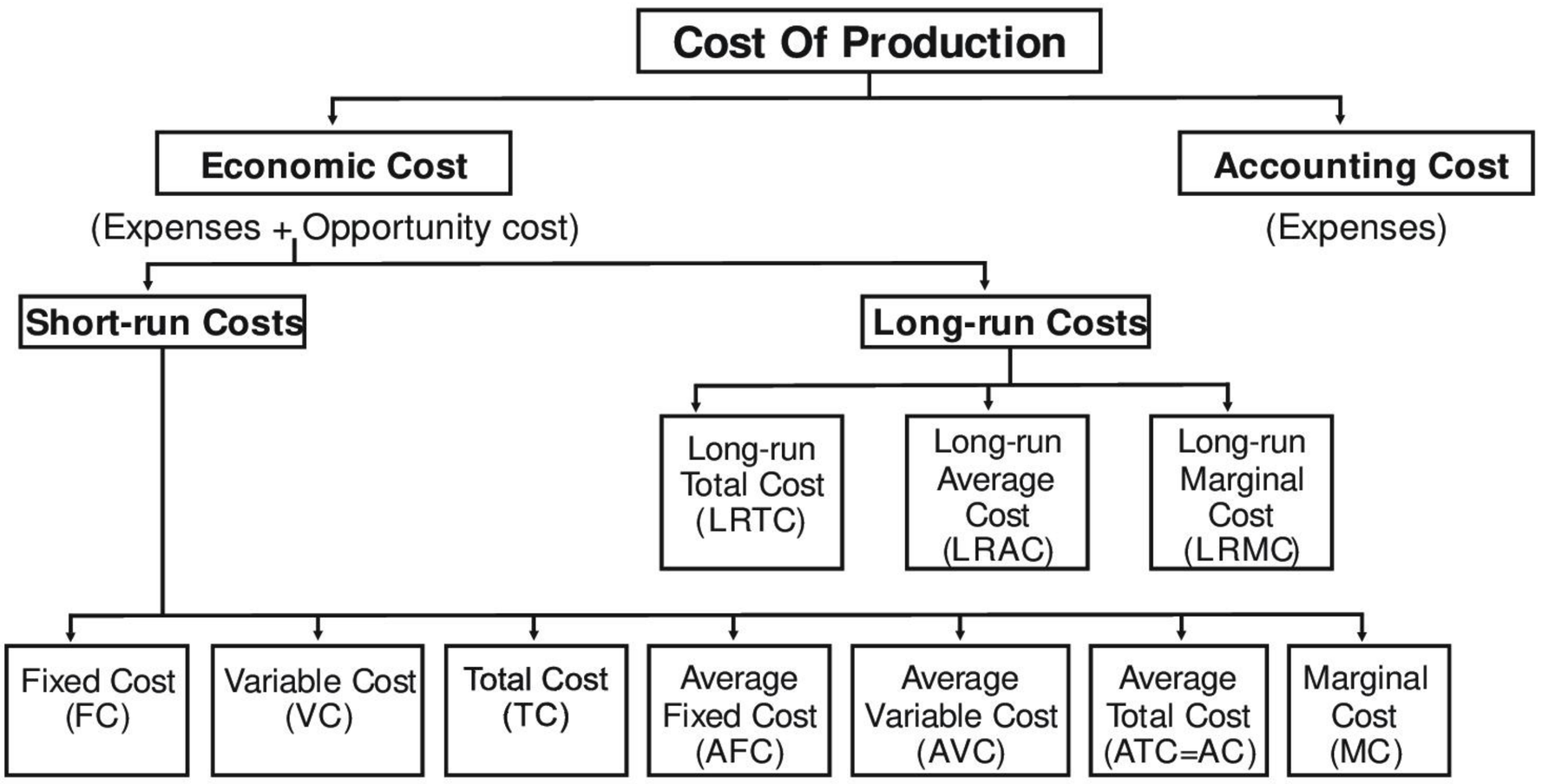


Short-run costs:

1. Total Cost (TC):

It is the sum of all sorts of expenses (including opportunity cost) in the production process. Total cost consists of:

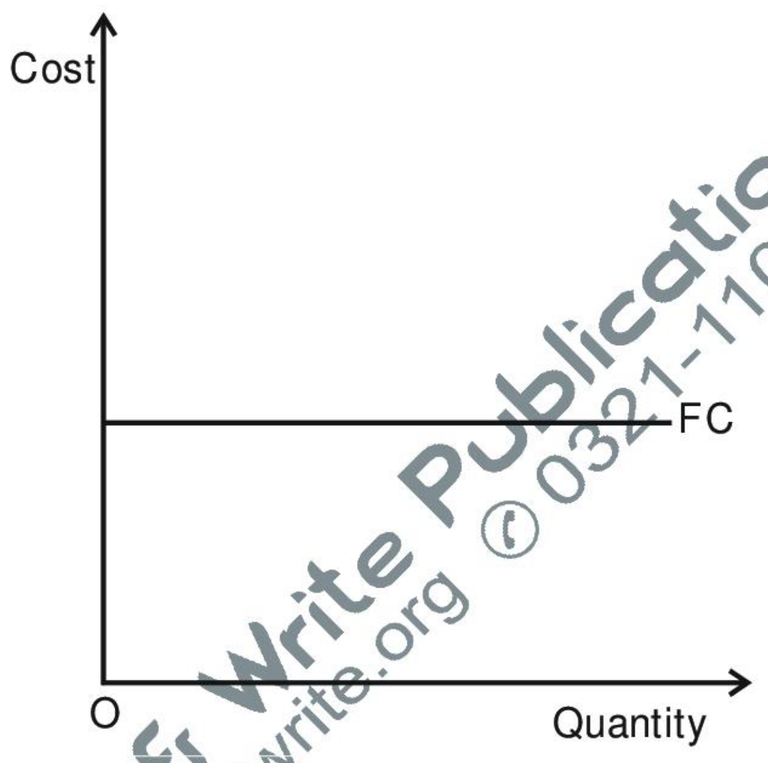
a. Total Fixed Cost (TFC).
b. Total Variable Cost (TVC)

2. Total Fixed Cost (TFC):

It is the part of total cost which does not vary with output and will incur even at an output of zero. Examples of fixed costs include rent, interest on loan, insurance premium, salaries of permanent staff, license fee charged by the government, etc.
Graphically:

Q	Fixed Cost (FC)
Increases	Constant
Decreases	Constant
Zero	Constant

The fixed cost curve is horizontal and parallel to the x-axis.



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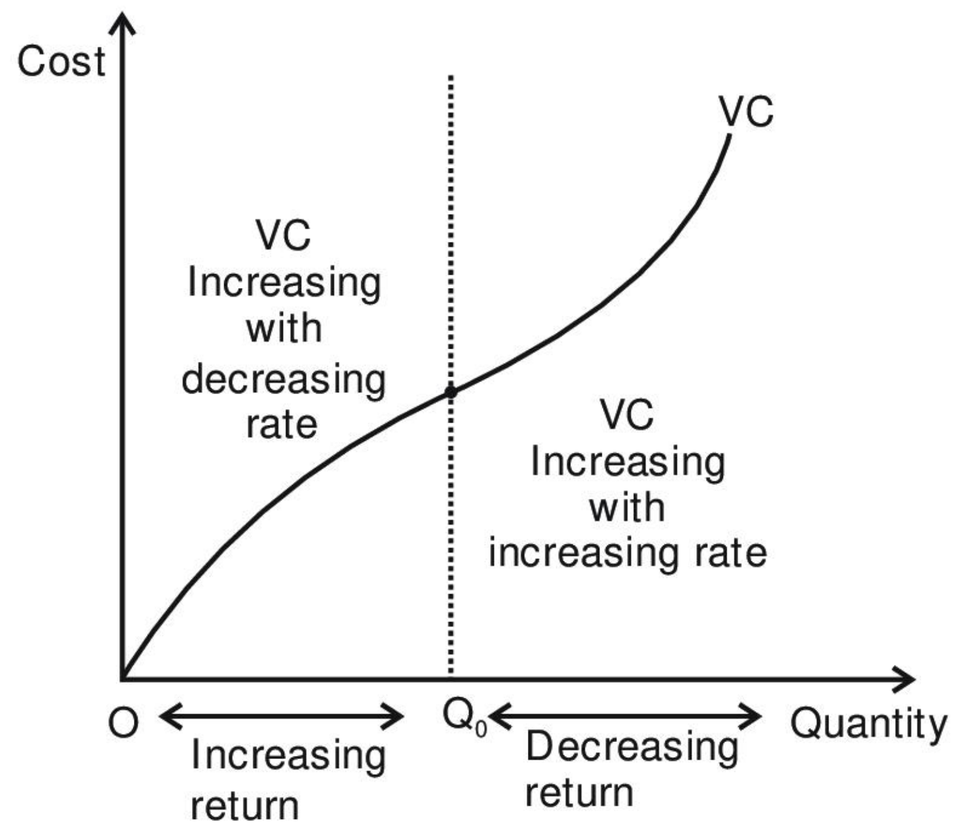
3. Total Variable Cost (TVC):

It is the part of total cost which varies with output and falls to zero when output is zero. Examples of total variable costs include the cost of raw-material, the cost of wages, the cost of transportation, the cost of fuel and energy, etc.

Graphically:

- The VC curve always originates from the origin (from zero).
- The VC curve is upward sloping.
- The VC curve is parallel to the TC curve.
- VC first increases at a decreasing rate, and then increases at an increasing rate once diminishing returns set in.

Q	Variable Cost (VC)
Increases	Increases
Decreases	Decreases
Zero	Zero



The shape of the VC curve is based on the law of diminishing returns. As long as there are increasing returns to a variable factor, VC increases at a decreasing rate; and when diminishing returns set in, VC starts increasing at an increasing rate. This can be explained with the following table.

Suppose that the only variable cost is the cost of labour.

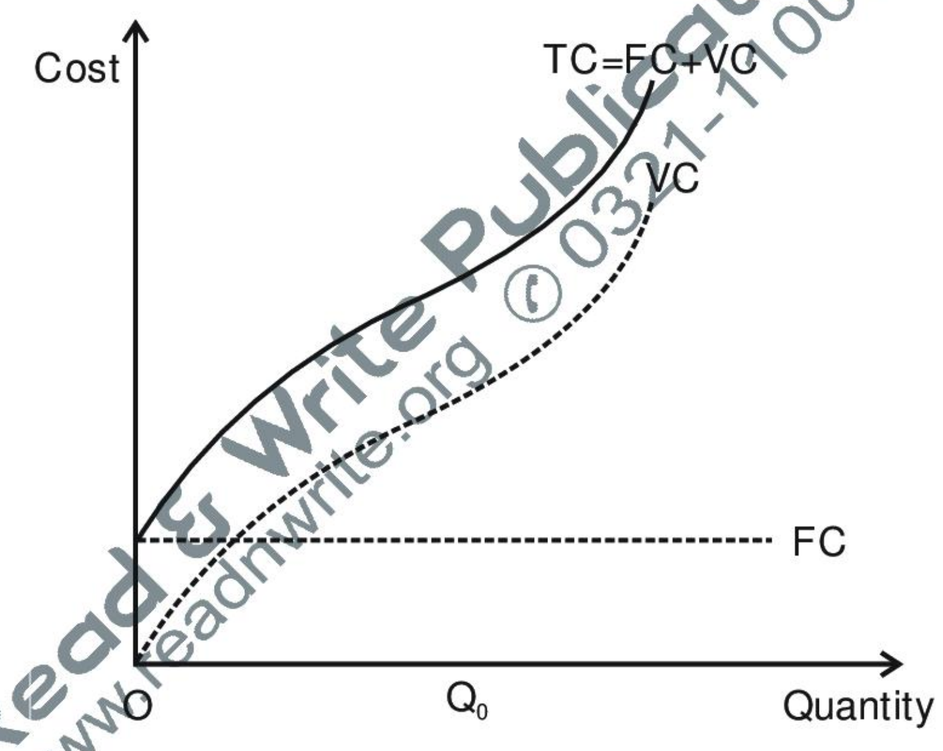
VC = Cost of labour = Wage rate × Units of labour

Units of Labour	Capital (K)	Total Product (TP=TPL=Q)	Wage Rate ($)	VC= W × L	
0	3	0	10	0	TP increases at an increasing rate; VC increases at a decreasing rate.
1	3	10	10	10	
2	3	24	10	20	
3	3	40	10	30	
4	3	48	10	40	TP increases at a decreasing rate; VC increases at an increasing rate.
5	3	50	10	50	

The total cost curve can be drawn by adding fixed cost to variable cost.

TC = FC + VC

- The TC curve starts from the FC curve.
- The TC curve will be higher than the VC curve.
- The gradient of the VC curve = The gradient of the TC curve.
- TC first increases at a decreasing rate (increasing returns to a variable factor are experienced).
- Then, TC increases at an increasing rate (diminishing returns to a variable factor are experienced).



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4. Derivation of Average Fixed Cost(AFC) from Total Fixed Cost (TFC):

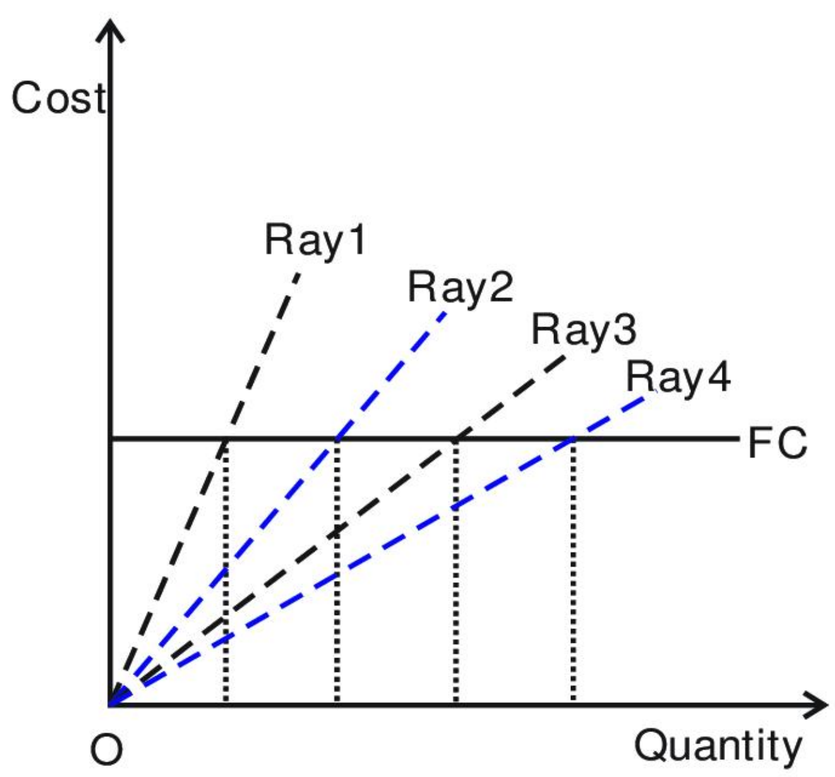
Average fixed cost is the total fixed cost divided by output produced.

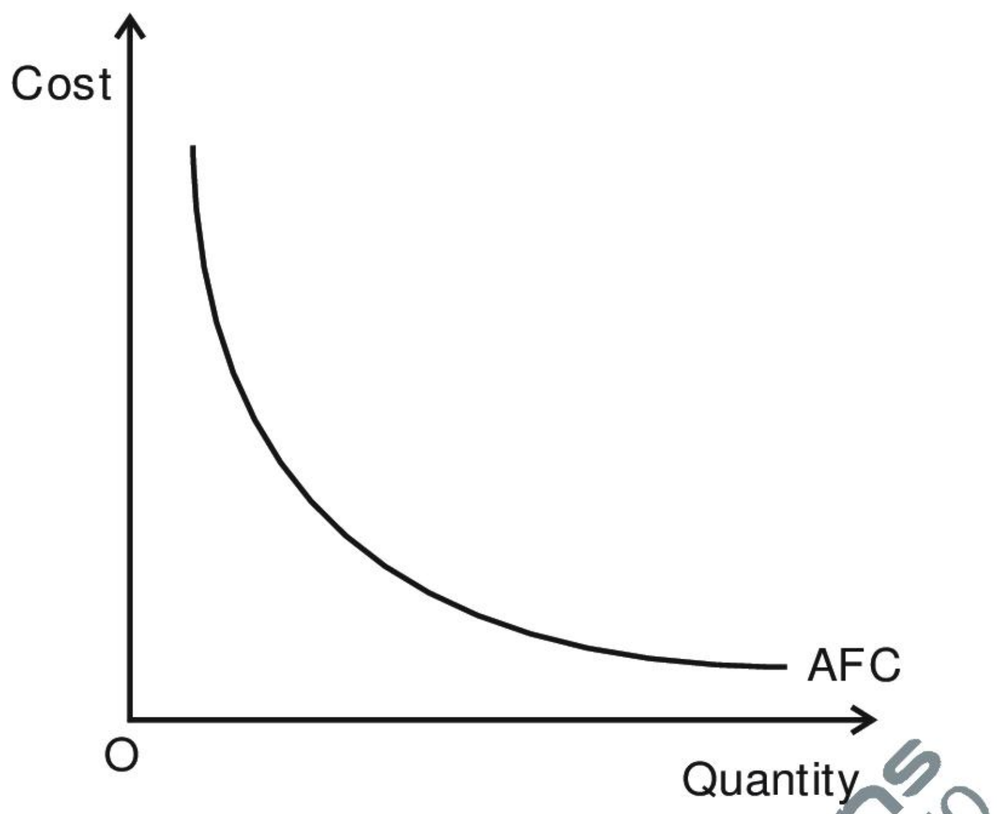
$$AFC = \frac{FC}{Q} = AC - AVC$$

Q	TFC	AFC= $\frac{FC}{Q}$
1	100	100/1=100
2	100	100/2=50
3	100	100/3=33.3
4	100	100/4=25

AFC can be derived from the TFC curve by drawing rays from the origin in order to estimate the gradient.

- AFC is always falling.
- AFC falls sharply in the beginning, but its fall eventually becomes more gradual as its “rate of decrease”(gradient) slows down.





5. Derivation of Average Variable Cost (AVC) from Total Variable Cost(TVC):

Average variable cost is total variable cost divided by output produced.

$$AVC = \frac{VC}{Q} = AC - AFC$$

AVC can be derived from the VC curve by drawing rays from the origin and connecting them to different points on the VC curve. The gradient of each ray will represent the value of AVC at that point

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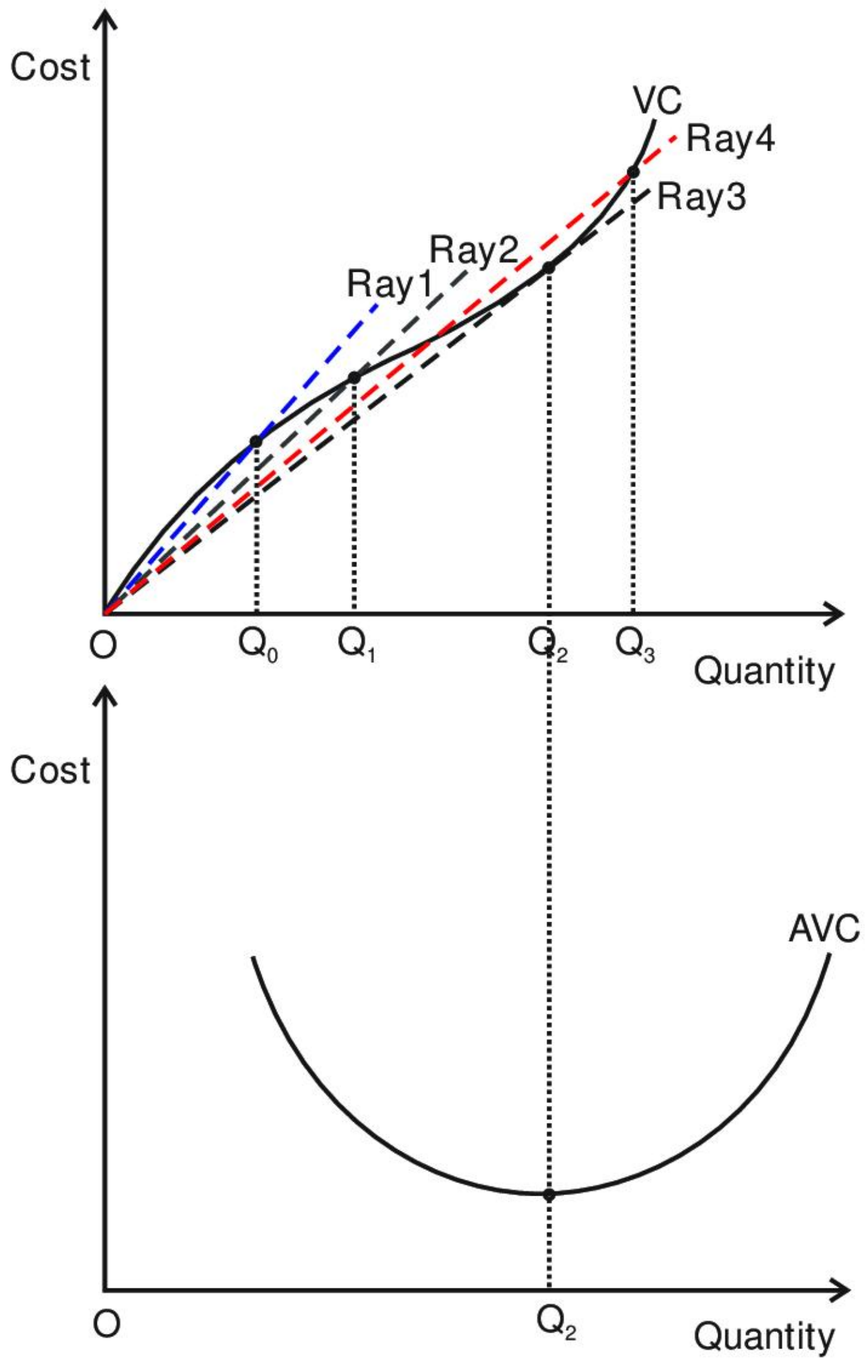

- An increase in output causes AVC to fall, and then, eventually, rise. The curve for AVC is, therefore, U-shaped.
- The falling part of the AVC curve indicates increasing returns to a variable factor, and the rising part indicates diminishing returns to a variable factor.
- AVC is minimum at the point where a ray drawn from the origin is tangent to the VC curve. (In the diagram on the right, this happens when Ray 3 is tangent to the VC curve at a quantity produced of Q_2.)

6. Derivation of Average Total Cost (ATC) from the Total Cost (TC) Curve:

Average total cost (ATC) or average cost (AC) is total cost divided by total output.

$$AC = \frac{TC}{Q} = \frac{FC+VC}{Q} = AFC + AVC$$

- An increase in output causes ATC to fall, and then, eventually, rise. The curve for ATC is, therefore, U-shaped.
- The falling part of the ATC curve indicates increasing returns to a variable factor, and the rising part indicates diminishing returns to a variable factor.
- AC is minimum at the point where a ray drawn from the origin is tangent to the TC curve.

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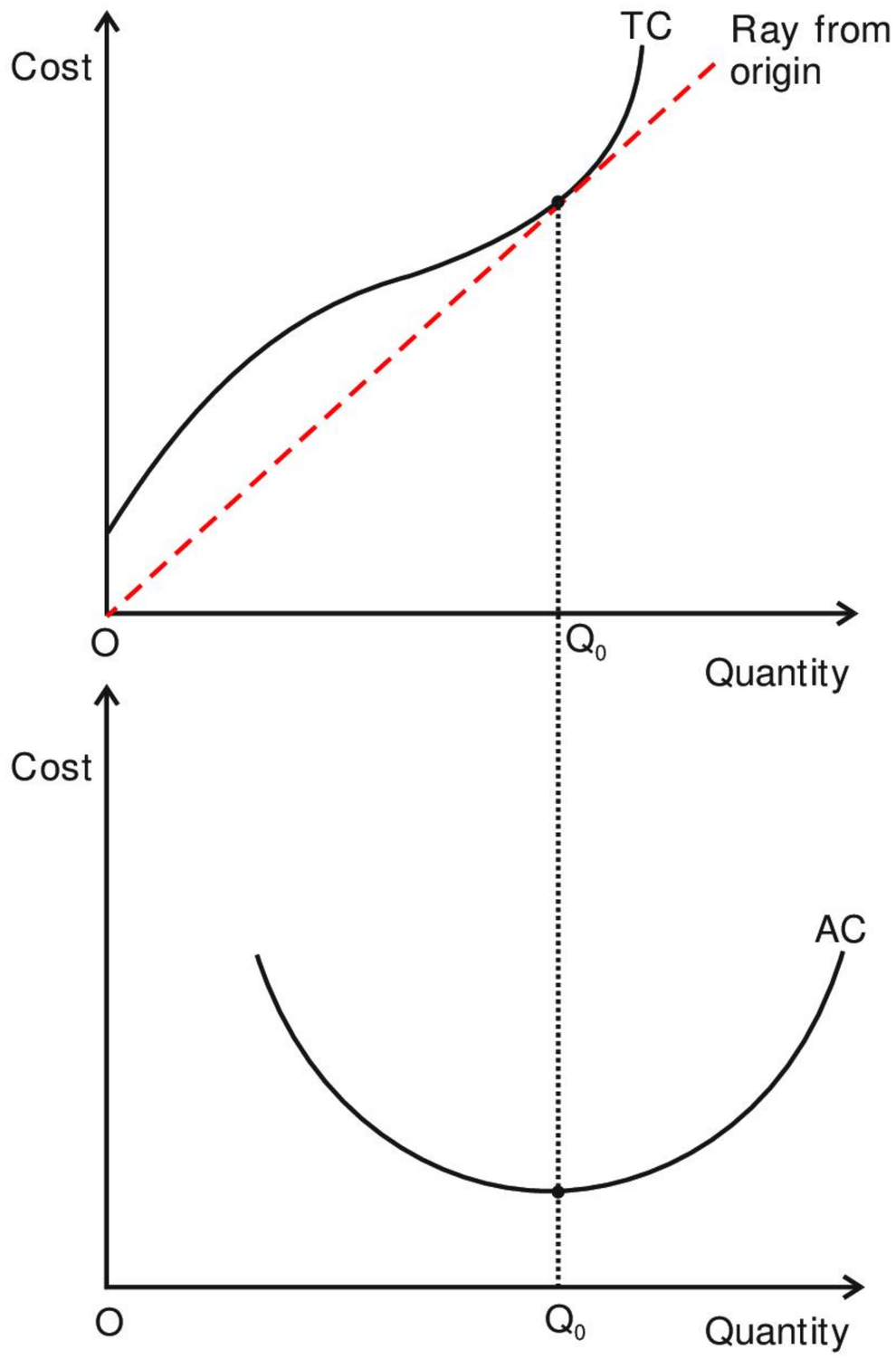

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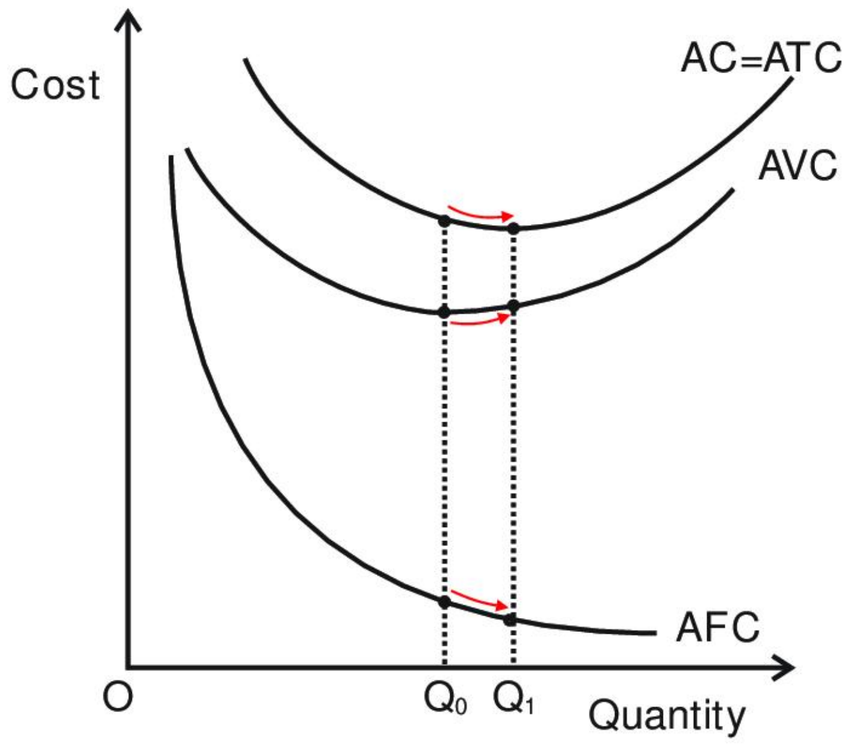
Relationship between AFC, AVC, and AC:



AC is the sum of AFC and AVC:

$$ATC = AFC + AVC$$

Therefore, both AFC and AVC contribute towards the shape of the AC curve. Consider the following diagram.

Initially, when output increases from O to Q_0, both AFC and AVC fall, so AC also falls. However, after Q_0, though AVC rises, AC continues to fall till output Q_1. Why is this?

This happens because AC is the sum of AFC and AVC. Although AVC begins to rise after Q_0, AFC continues to fall because the rate of decrease in AFC is greater than the rate of increase in AVC; e.g., if AFC falls by 5% between Q_0 and Q_1, and AVC rises by just 3%, AC will decrease by a net proportion of 2%.
Hence, the turning point (i.e., the minimum point)of the AVC curve is reached before that of the AC curve.

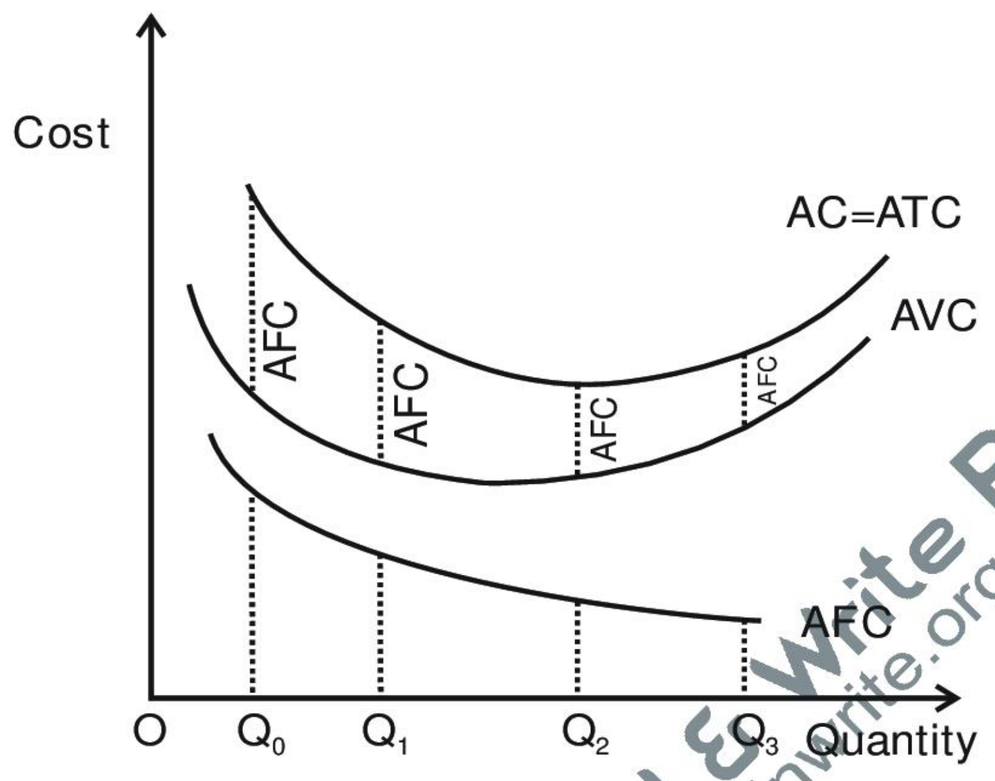
Why are AVC and AC not parallel to each other?

$$ATC = AFC + AVC$$

From this, we can deduce that:

$$AFC = ATC - AVC$$

And, graphically, AFC is the vertical distance between AC and AVC.
According to the above diagram, when AFC is initially high, there is a greater distance between AC and AVC; but, as output increases, the gap between the AC and AVC curves decreases, since AFC continues to decrease as well. Therefore, AC and AVC cannot be parallel to each other.



Derivation of Marginal Cost (MC) from the Total Cost (TC) curve:

Marginal cost is the cost of an extra unit of output produced. In other words, marginal cost is the change in total cost due to a unit change in output produced.

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$$MC = \frac{\Delta TC}{\Delta Q}$$

Where:
Δ = change in
TC = total cost
Q = output or quantity

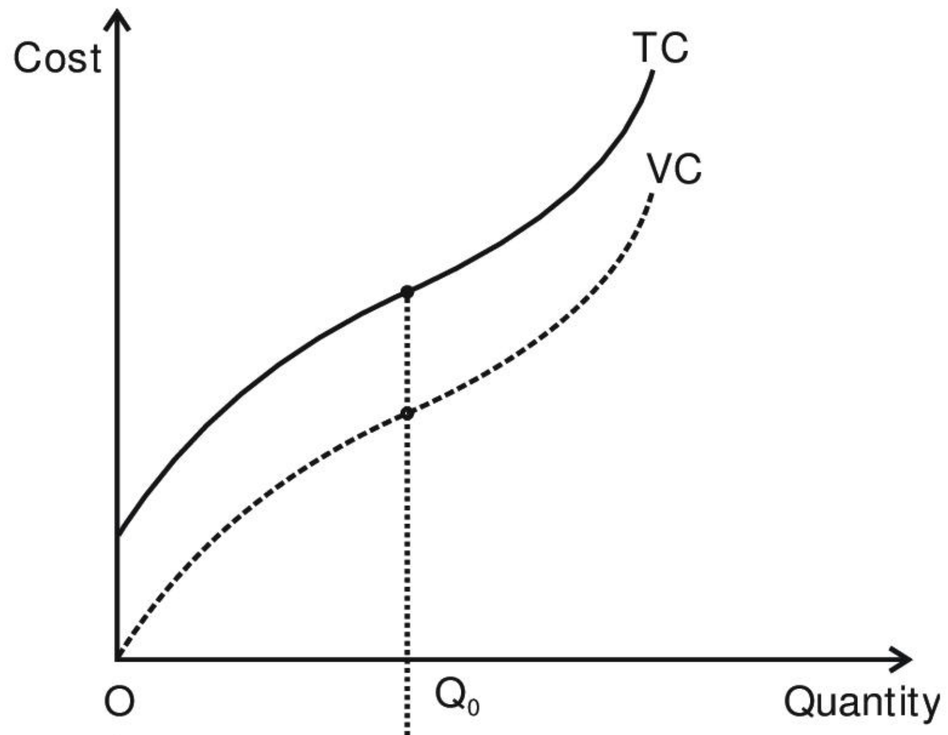
Here, total cost consists of fixed costs and variable costs.

$$TC = FC + VC$$

And we know that changes in output only affect variable cost, not fixed cost; therefore, we can rewrite the MC formula in the following way:

$$MC = \frac{\Delta TC}{\Delta Q} = \frac{FC + \Delta VC}{\Delta Q} \text{ or } MC = TC_n - TC_{n-1} \text{ or } MC = VC_n - VC_{n-1} = \Delta VC$$

Graphically, marginal cost can be determined by calculating the gradient of either the total cost curve (TC) or total variable cost (VC) curve.



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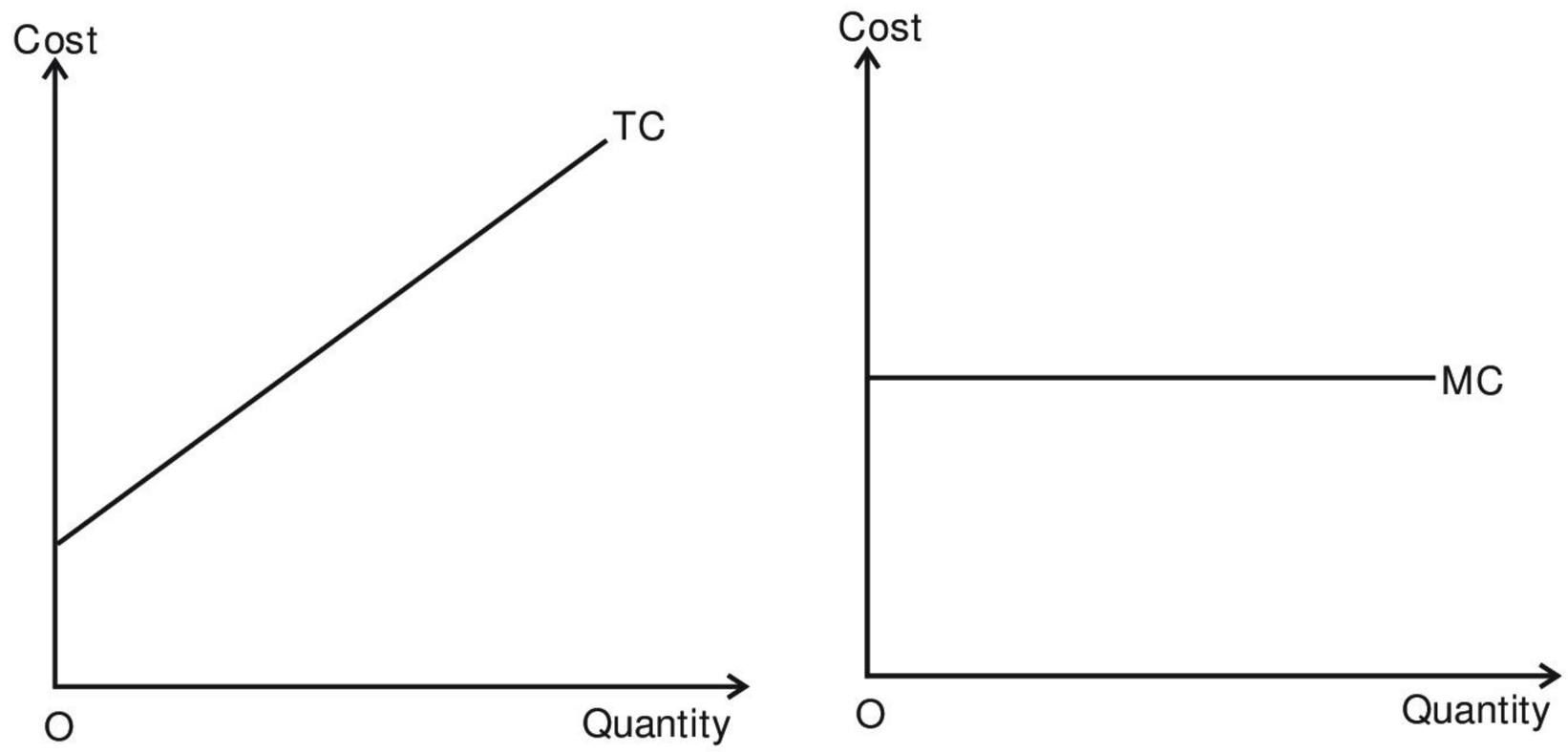
Initially, till output Q_0, TC rises at a decreasing rate, after which it continues to rise, but at an increasing rate. Marginal cost (corresponding to the TC curve) initially falls, reaches a minimum at output Q_0, and then rises.

MC when TC rises with constant rate?



MC when TC = constant (i.e., when VC = 0 and TC = FC)

Provided that TC = constant, there is a zero change in total cost. As MC is the rate of change in total cost, the value of MC in this case will be zero.

When:

TC = Constant MC = 0

Relationship between MC and VC:

Marginal cost is the cost of an extra unit of output produced, whereas total variable cost (VC) is the part of total cost (TC) that changes as output varies.
Total variable cost (VC) can be derived through the summation of the marginal costs of all units produced, i.e.:

$$VC = MC_1 + MC_2 + MC_3 + \ldots\ldots MC_n \qquad VC = \sum MC$$

Similarly, marginal cost can be found by calculating the change in total variable cost (VC), i.e.:

$$MC = \Delta VC = VC_n - VC_{n-1}$$

Consider the following table:

Q	MC	VC = ∑ MC
0	–	0
1	10	10
2	8	10+8=18
3	12	10+8+12=30
4	15	10+8+12+15=45

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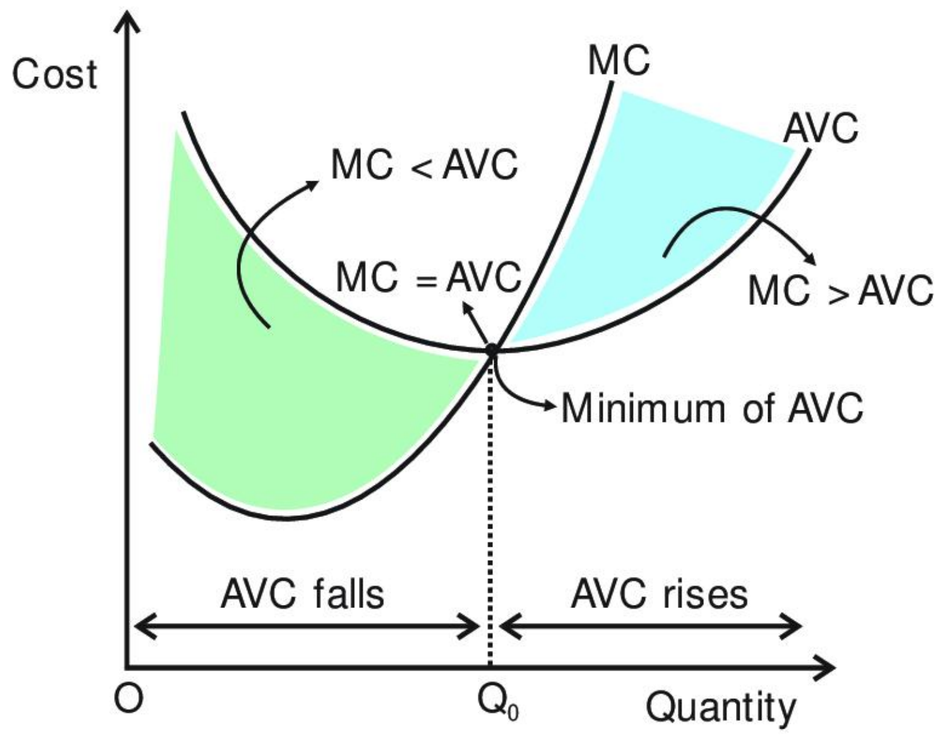
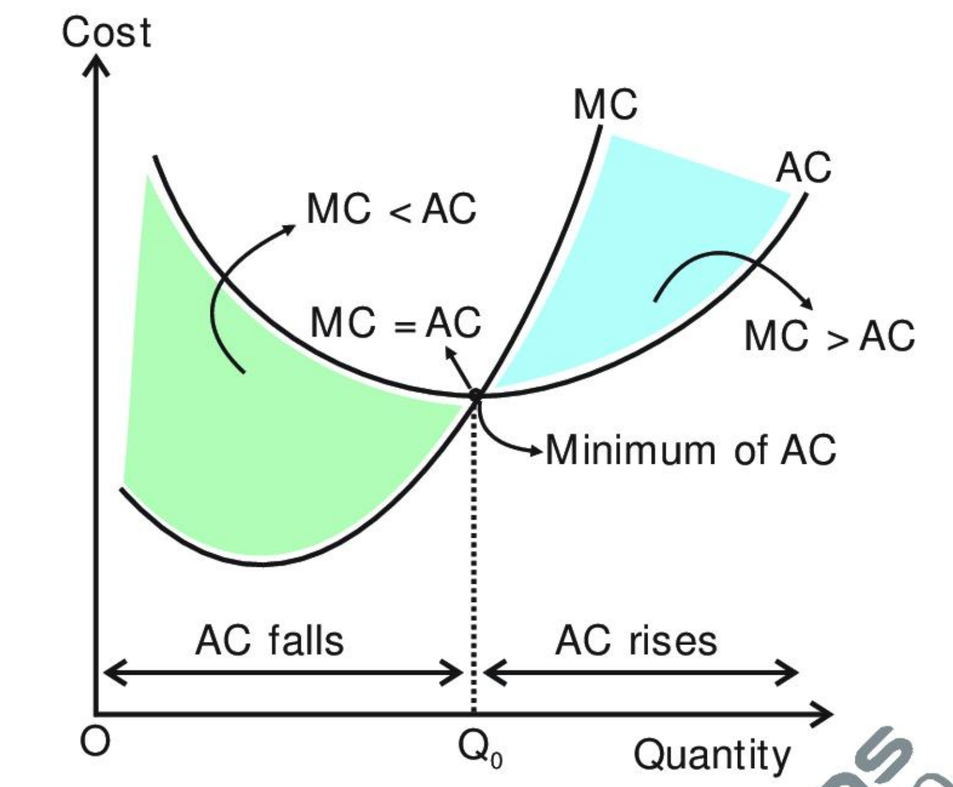
Relationship between MC and AVC:

If	Then
MC < AVC	AVC ↓
MC = AVC	AVC=Minimum
MC > AVC	AVC ↑



Relationship between MC and AC:

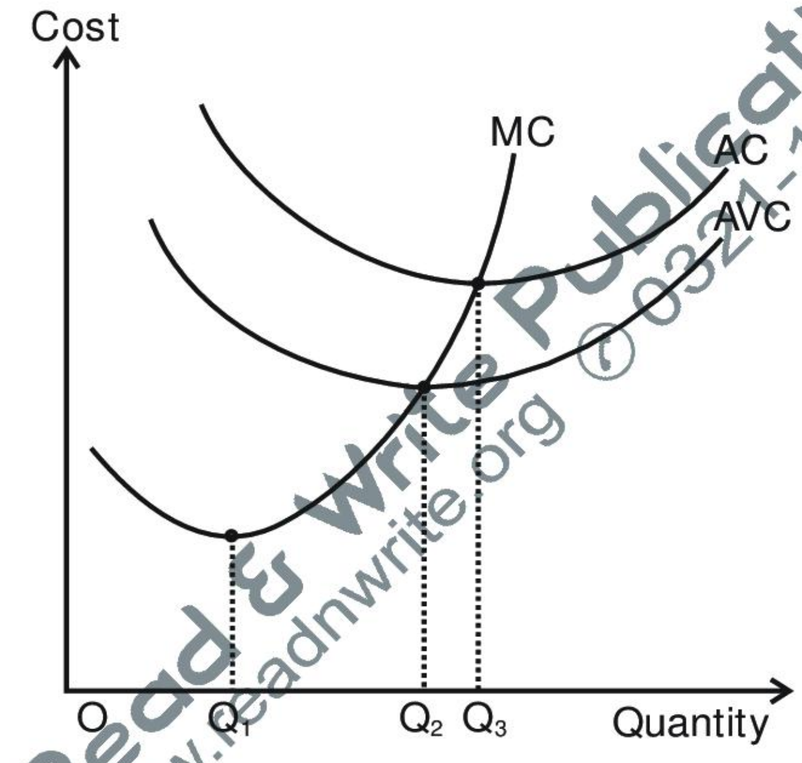
If	Then
MC < AC	AC ↓
MC = AC	AC= Minimum
MC > AC	AC ↑



CONCLUSION:

- The MC curve always passes through the minimum points on the AVC and ATC curves.
- Order of turning points or rising trend among MC, AVC, and AC is:

  First → MC
  Second → AVC
  Third → AC



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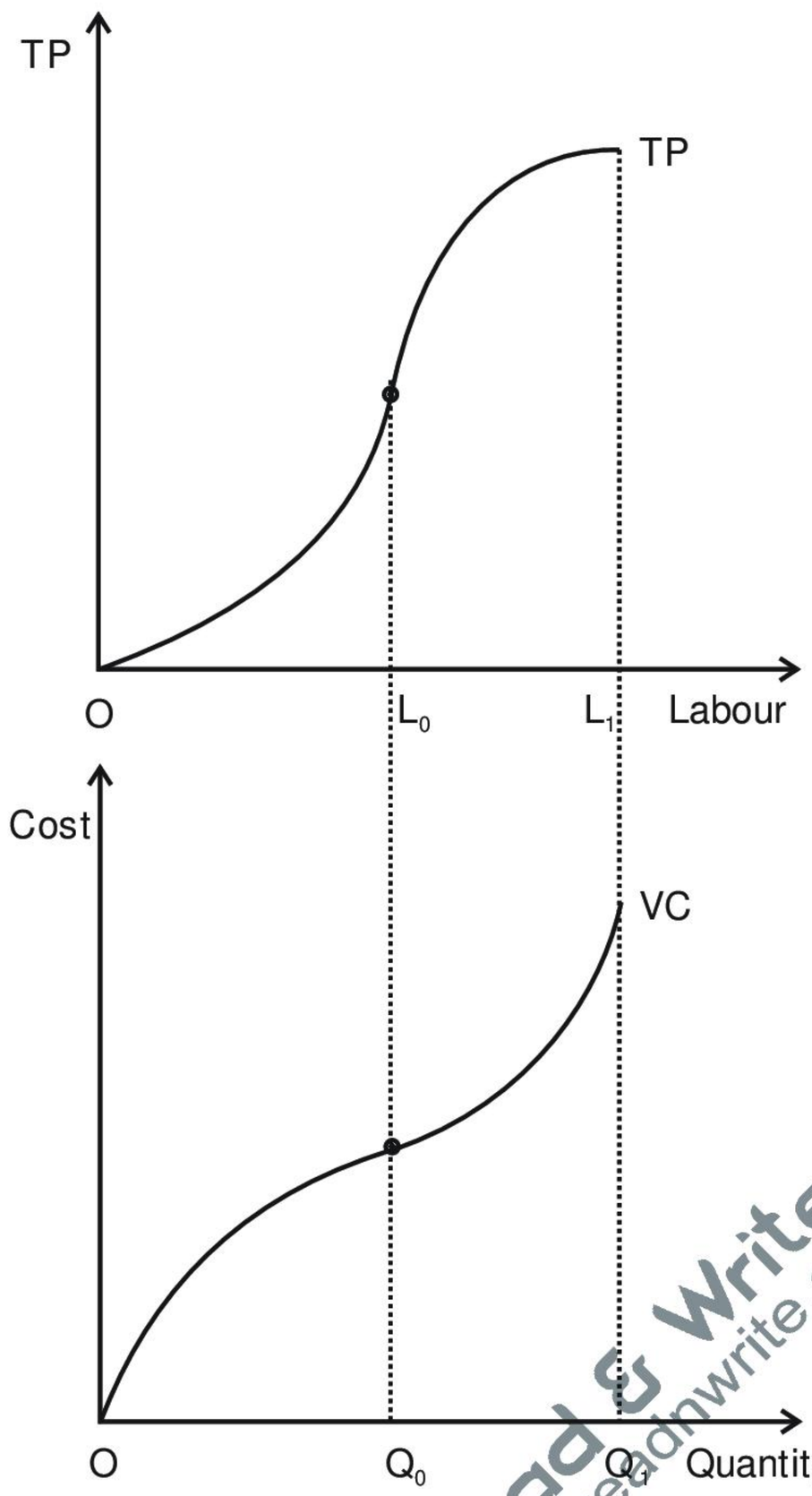
Relationship between short-run costs & Law of Diminishing Returns

1. Relationship between total product (TP) and variable costs (VC):

Between the origin and point L_0 in the diagram below, total product is increasing at an increasing rate, since production continues to increase in efficiency as the fixed input is more intensively utilized by the variable input. Associated with these increasing returns is an increase in total variable costs at a decreasing rate(between an output of O and Q_0).

On the other hand, between $L_0$and L_1,as according to the law of variable proportions, the total product is increasing at a decreasing rate. As more of a variable factor is combined with a fixed factor, the relative shortage of the fixed factor will eventually cause an increase in the total product to become progressively smaller; that is, the factor combination becomes more inefficient. The decreasing returns are associated with an increase in total variable cost at a decreasing rate, between output Q_0 and Q_1.



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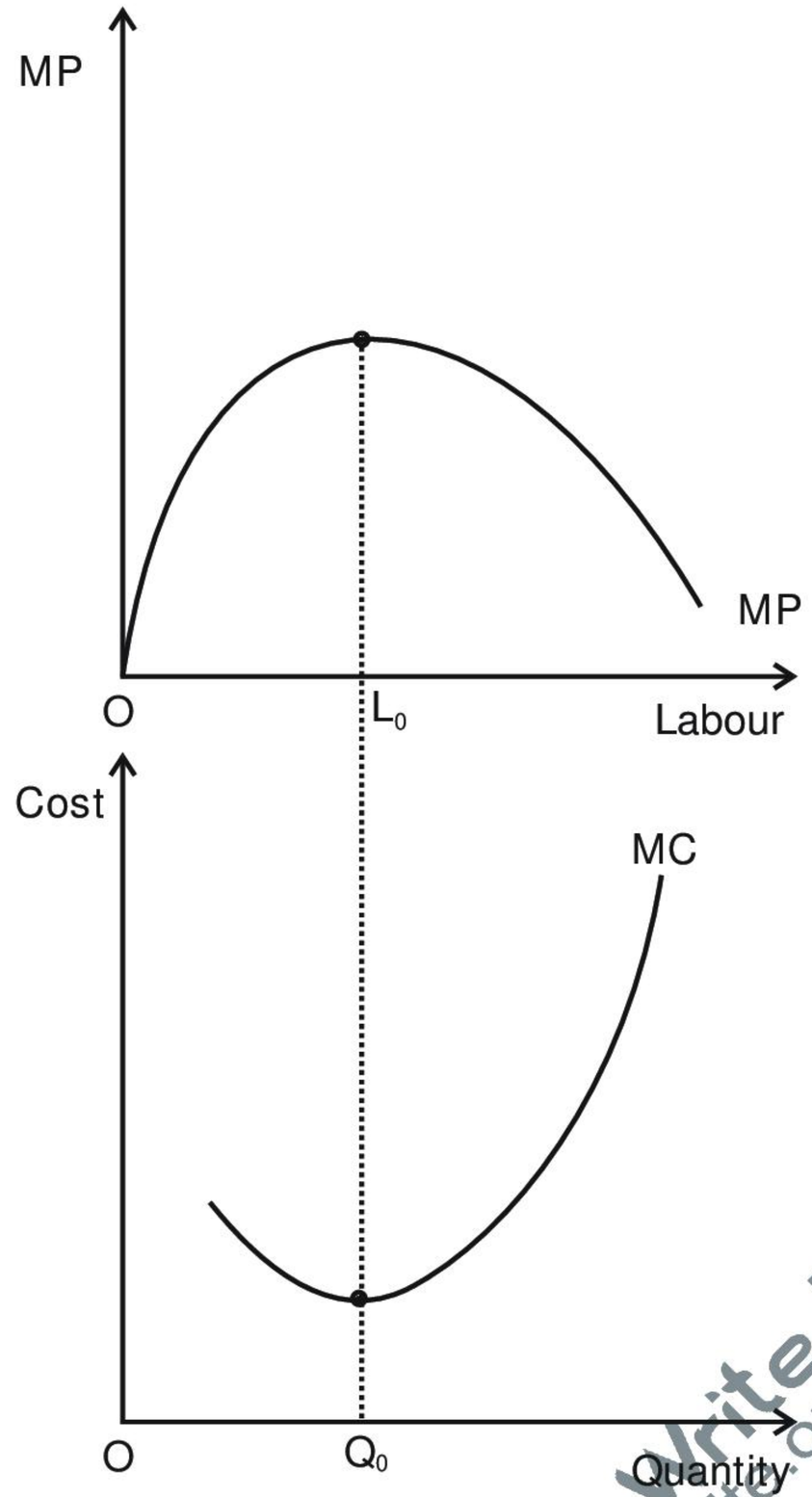
In conclusion, total product refers to the total output amount produced during a given period of time by all employed factors of production. The total variable cost refers to the sum of all expenses incurred because of variable inputs (which vary directly with the level of output with the firm in the short run), such as

wages, raw materials, transport costs, etc. Variable costs depend on total product, which, in turn, depends on the law of diminishing returns.

2. Relationship between marginal product (MP) and marginal costs (MC):

In the diagram below, the marginal cost curve is shown as a curve that reaches a minimum at Q_0, and then begins to rise. It looks similar to an inverted marginal product curve. Marginal product (MP) is the addition to total product when an additional factor is used, while marginal cost (MC) refers to the cost of producing an extra unit. Extra units are manufactured by employing additional workers. Assume that each worker receives the same wage. Initially, each extra worker is able to produce more than the previous worker because, at first, the extra workers have easy access to a fixed number of machines and the principle of division of labour can be applied. Since the firm is initially obtaining an increasing marginal product with a constant outlay on wages, marginal costs continue to fall till output Q_0. Beyond Q_0, diminishing returns set in and the firm's marginal product decreases with a constant outlay on wages. The fixed factor is exhausted and workers experience a delayed access to machines. Therefore, as marginal product diminishes, marginal cost increases.



3. Relationship between average product (AP) and average variable cost (AVC):

In the diagram below, the average variable cost curve is U-shaped, whereas the average product curve is shaped as an inverted U. Average variable cost (AVC) is obtained by dividing total variable cost (VC) by the number of units produced; average product (AP) is obtained by dividing total product by the units of variable factor used to produce the output.

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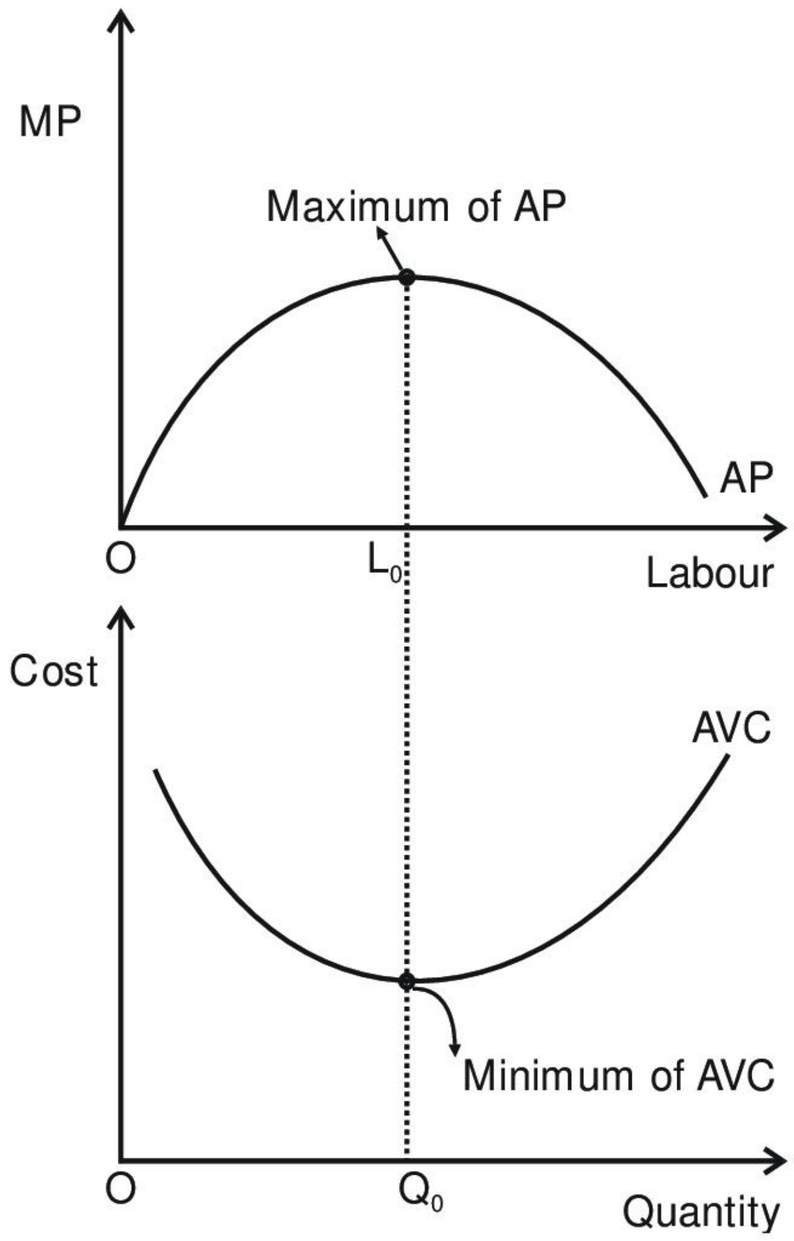
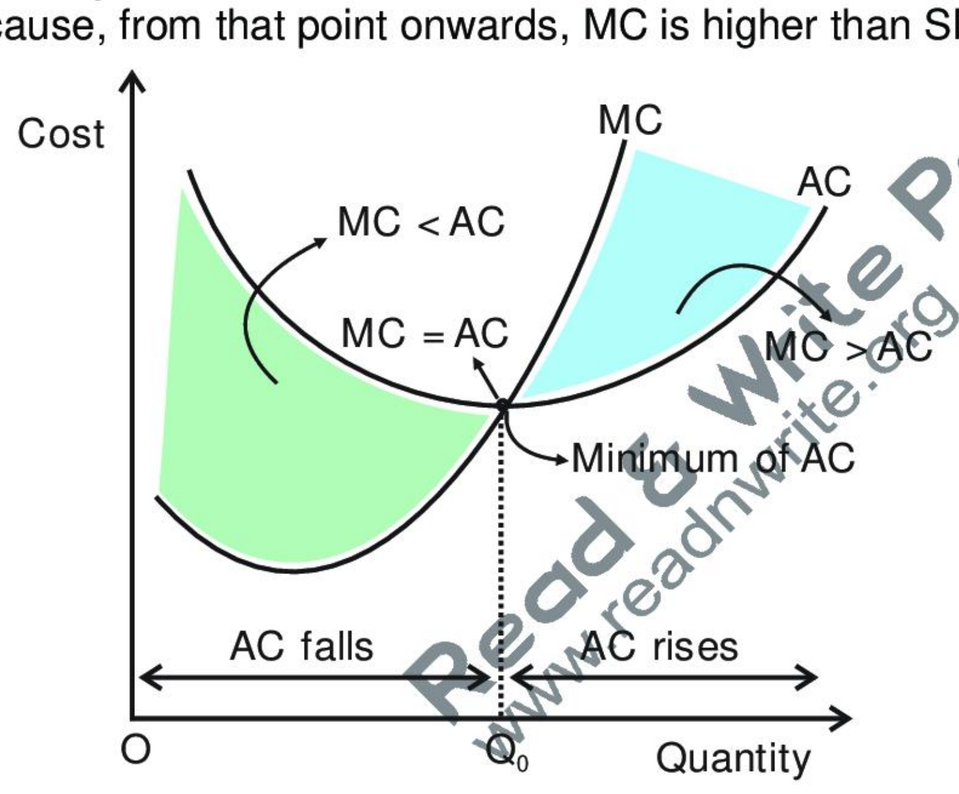
With fixed factor prices, AVC is at a minimum at Q_0 when average product is at a maximum at L_0. The common sense of this is that each additional worker adds the same amount to cost but a different amount to output. When output per worker is rising, the cost per unit of output must be falling. On the other hand, if output per worker is falling, then the cost per unit of output must be rising. Thus, there is an inverse relation between average product and average variable cost—as illustrated in the diagrams.



4. Relationship between law of diminishing returns, marginal cost (MC), and average cost (AC):

Short-run average cost (AC) is the cost per unit of output produced. Short-run average cost (SRAC)depends on the behavior of marginal cost. The SRAC curve slopes downwards until Q_0 because, till that point, marginal cost is less than unit cost. After Q_0, the short-run average cost curve begins to rise because, from that point onwards, MC is higher than SRAC.



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It has been established that the shape of the short-run average cost curve is determined by the shape of the marginal cost curve, which in turn is determined by the law of diminishing returns. The type of return experienced depends on the degree of access workers have to machines and on the scope for division of labour.

Finally, as illustrated and explained in the above examples, the operation of variable proportions or the law of diminishing returns has a certain effect on a firm's short-run production costs—namely total variable cost, average variable cost, and marginal cost.

Economies and diseconomies of scale:

When an increase in the scale of production results in a more than proportionate increase in output, the firm is said to be experiencing economies of scale. Economies of scale might be defined as those aspects of increasing firm size which lead to falling long-run average costs. Economies of scale are classified into internal and external economies.

Internal and external economies of scale:

Internal economies of scale are those which arise from the growth of the firm itself, and are independent of what is happening to other firms. They arise simply from an increase in the scale of production in the firm itself. A firm may grow as a result of increasing the number of plants (workplaces) it has, or increasing the size of its plants.

External economies of scale are those advantages in the form of lower average costs which a firm gains from the growth of the industry. These economies are available to all firms in the industry and are independent of changes in the scale of their individual outputs.

1. **Internal economies of scale:**

Internal economies of scale can be divided into:

- Technical Economies.
- Marketing Economies.
- Financial Economies.
- Research and Development Economies.
- Managerial Economies.
- Risk-bearing Economies.

1. **Technical Economies:**

Increased specialization: The larger the workplace, the greater are the opportunities for the specialization of workers and machines. In a larger workplace the process can be broken down into many separate operations. Workers can be employed on specialized tasks, and the continuous use of highly specialized equipment becomes possible. For example, in a large college the staff can specialize in a wide range of courses for which there may be specialist rooms.

Indivisibility: Some types of capital equipment can only be employed efficiently in units of minimum size, a size which may be too large for a small plant to sustain. There is a lower limit to the size of a blast furnace, a nuclear power station, a car assembly line, and a power press. This lower limit may be a technical limit, as when the manufacture of a smaller version of equipment is impractical. More generally, however, the limit is an economic one; smaller versions of equipment can be purchased but their usefulness would not justify the cost of buying them. Such indivisibility of plants means that workplaces with small outputs cannot take advantage of some highly specialized equipment. In a small plant, this type of capital equipment would be left idle for a large part of time. The heavy fixed costs it incurs would be spread over small outputs and the average cost per unit of output would be disproportionately high.

Increased dimensions: If you double the length, breadth, and height of a cube, its surface area is four times as great and its volume eight times as great as the original. This simple arithmetical principle accounts for the remarkable increase in the dimensions of much large scale capital equipment in recent years. For example, a modern oil tanker of 240,000 tonnes is only twice the

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size of a 30,000 tonne tanker in terms of length, width, and height, and only four times as large in terms of surface area despite having eight times its capacity. It requires very few extra crews and, if any, will certainly not require eight times the power to propel it through water. Economies of increased dimensions account for the tendency of industries which make use of tanks, vats, furnaces, transport equipment, etc. to operate larger and larger units.

The principle of multiples: Industrial plants may use a variety of machines, each carrying out a different operation. Each of these machines is likely to have a different capacity. For example, the machine which wraps blocks of chocolate in silver paper operates faster than the machine which moulds those blocks of chocolate.

By-product economies: A large plant may be able to sell or convert its by-products. For instance, a large stable may be able to sell the manure from its horses on a commercial basis. A large petroleum refinery plant may process chemicals extracted from oil and sell them. One of the most famous by-products is Tupperware, which has become very profitable.

Economies of linked processes: A large plant may have the capacity to produce more than one product or service. For instance, iron and steel may both be produced in one large factory. A large bank branch, in addition to carry out standard banking services may also operate an estate agency department.

Stock economies: A large plant can operate with smaller stocks in proportion to its sales than a smaller firm can. This is because variation in orders from individual customers and unexpected changes in customers' demand will tend to offset each other when total sales are very large.

2. Marketing Economies:

A large firm is able to buy its material requirements in large quantities. Bulk buying enables the large firm to obtain preferential terms from the supplier. It will be able to obtain goods and services at lower prices and dictate its requirements with regard to quality and delivery much more effectively than the smaller firm. By placing large orders for particular lines, bulk buyers enable suppliers to take advantage of the lower costs incurred in the long run—a much more economical proposition than trying to meet a large number of small orders from small firms each requiring a different colour, or quality, or design.

Large firms will be able to employ specialized buyers, whereas in a small firm buying will usually be the responsibility of an employee who will have several other responsibilities. Specialist buyers are likely to have better knowledge and skills which enable them to buy the right materials, at the right time, and at the right price more easily.

The selling costs of a large firm will be much greater than that of a small firm, but the selling costs per unit will generally be much lower because the number of units is also greater. The selling costs of a large firm may be $100,000 per annum, while those of a small firm might be as low as $5,000 per annum. But if the large firm is selling 1,000,000 units per annum, while the small firm only sells 20,000 units per annum, the selling cost per unit of 10p for the large firm is far lesser than the 25p for the small firm. In selling, as in buying, the larger firm can afford to employ experts whose specialized skills can give it economic advantages.

Packaging costs per unit will be lower. A package containing 100 articles is much easier to pack than 10 separate packages containing 10 articles. The clerical and administrative costs of dealing with an order for 1000 articles involves no more work than that involved in an order for 100, neither do transport costs increase proportionately with volume. Although many large firms spend huge sums on advertising, their advertising costs per unit sold may well be less than those of a small firm.

3. Financial Economies:

A large firm has several financial advantages. The fact that it is large and well-known makes it more worthy of borrowing. Its greater selling potential and larger assets provide lenders with greater security, and encourage them to provide bigger loans at lower rates of interest than would be charged to a smaller firm.

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A large firm has access to more sources of finance. In addition to borrowing from banks, it may approach a wide variety of financial institutions, as well as take advantage of the highly developed market in the issuing of new shares and debentures.
The terms on which funds can be borrowed are more favorable to a large-scale borrower because the lending of money in large amounts, like the bulk supply of materials, yields economies of scale.

4. **Research and Development Economies.**
A research department must be of a certain size in order to work effectively. To a small firm, this minimum-efficient size may represent a level of expenditure too large to justify any possible returns. To a large firm, however, the expenditure may be relatively small because the cost is spread over a large output.

5. **Managerial Economies.**
Large firms can employ specialist accountants, lawyers, personnel officers, etc. In these large firms specialists can be fully utilized, but it is doubtful that a smaller firm could find enough specialized work to keep them fully occupied. A small firm, however, can overcome this problem to some extent by hiring specialists from agencies that provide them, when the need specifically arises.

6. **Risk-bearing economies.**
Large firms are usually better equipped than small firms to cope with the risk of trading. Over time, total demand will be more stable and predictable than in the case of small firms, for which variations in individual orders will tend to have a relatively large impact on the overall business. An example of this is the operation of a national grid to which many generating stations are connected. If each electricity-generating station supplied only to its own locality, every station would have to maintain enough capacity to meet any possible level of demand, however exceptional. With a national grid, however, many of these exceptional variations in demand are balanced, because they occur at different times, or in different places, so that the total capacity required by the system to meet the national demand will be much less than if there were many separate generating stations each supplying to their own areas.
Many large firms choose to reduce the risks of trading through diversification. They produce either a variety of models of a particular product or a variety of products, so that they do not put all their eggs in one basket. A fall in demand for any one of its products may not mean serious trouble for the firm if demand for one or more of the other products increases. A small firm on other hand usually has to specialize in producing a much narrower range of products, any fall in demand for which may have much more serious consequences. A large firm is also likely to have a diversified market structure. In the national market demand fluctuations in regions may offset one another; a fall in the demand in the home market might be balanced by a rise in demand abroad. A small firm with a restricted market is much more vulnerable to changes in market conditions.

Internal Diseconomies of Scale

Increasing size brings many advantages, but it can also bring disadvantages.
For each particular firm there will be some optimum size for which average cost reaches a minimum. This optimum size will vary over time as technological progress changes techniques of production. As firms grow beyond this optimum size, efficiency declines and average costs begin to rise. The main problems which arise when a firm grows too large are thought to be mainly because of management difficulties.

As the size of the firm increases, management becomes more complex. It becomes increasingly difficult to carry out the management functions of co-ordination, control, communication, and to maintain good industrial relations.

1. **Co-ordination**
Large firms are likely to be divided into many specialized departments (production, planning, sales, purchasing, personnel, accounts, etc.). As these departments multiply and grow in size, the

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task of coordinating their activities becomes more and more difficult. Consulting a team of managers takes time and decision-taking in a large firm may be slower than in a small firm. If this is the case, a large firm will respond less quickly to changes in market conditions than in small firms.

2. Control

Essentially, management consists of two basic activities: making decisions and asserting control. The large firm usually has several tiers of management (managing director, director, head of department, etc.) but, in practice, the problem of overseeing what is going on can be difficult.

3. Communication

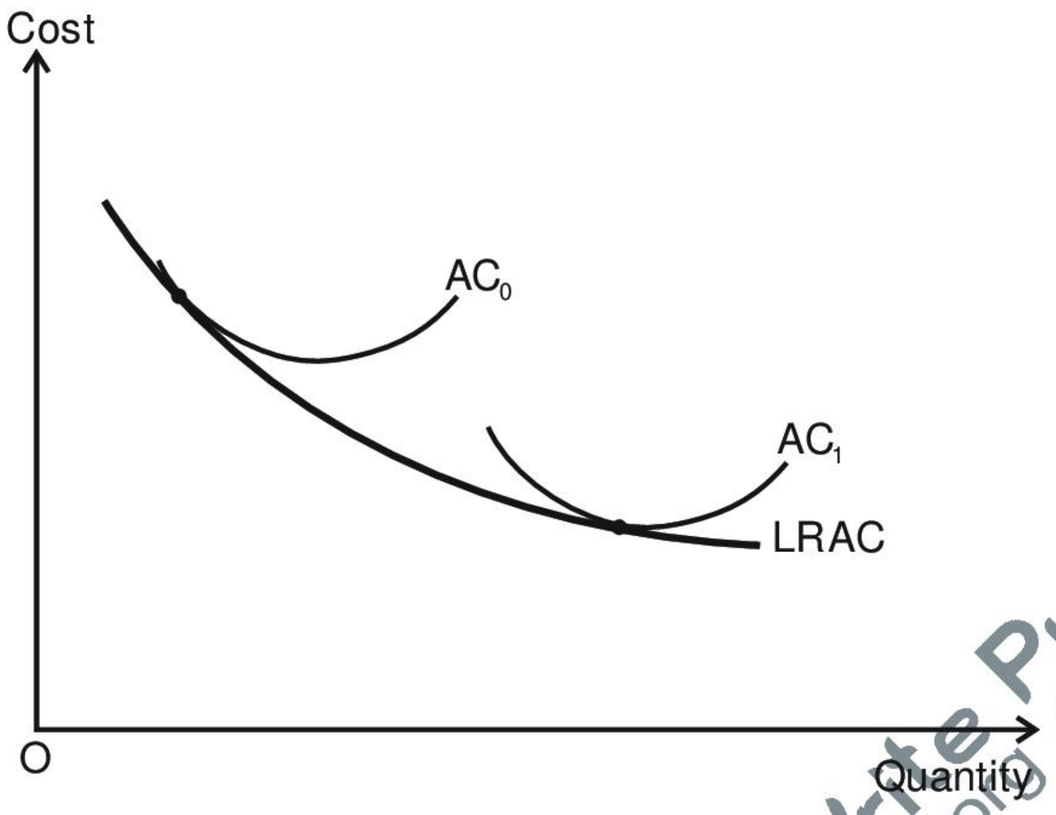
Keeping everyone informed and feeling involved in a large firm can be a difficult and time-consuming process. A lot of time may have to be spent in meetings and ensuring that everyone knows what is going on and why.

4. Industrial relations

Large plants tend to have worse industrial relations than small ones. It is thought that, when there are a large number of people working in one place, it takes longer to sort out any problems which people have because there are more people to have conflicts with. In large firms employing thousands of workers it can be difficult to make any individual worker feel that he or she is an important part of the firm, and people low down the pyramid of control may lack an identification of interest with the firm.

Effect of Internal Economies of Scale on Short-run Cost Curves and Long-run Cost Curves:

Internal economies of scale will shift the SRAC (short-run average cost) and SRMC (short-run marginal cost) curves down while causing a movement along the LRAC (long-run average cost) and LRMC (long-run marginal cost) curves.



Effect of Internal Diseconomies of Scale on Short-run Cost Curves and Long-run Cost Curves:

Internal diseconomies will shift the SRMC and SRAC curves upward, causing an upward movement along the long-run average cost (LRAC) curve and long-run marginal cost (LRMC) curve.

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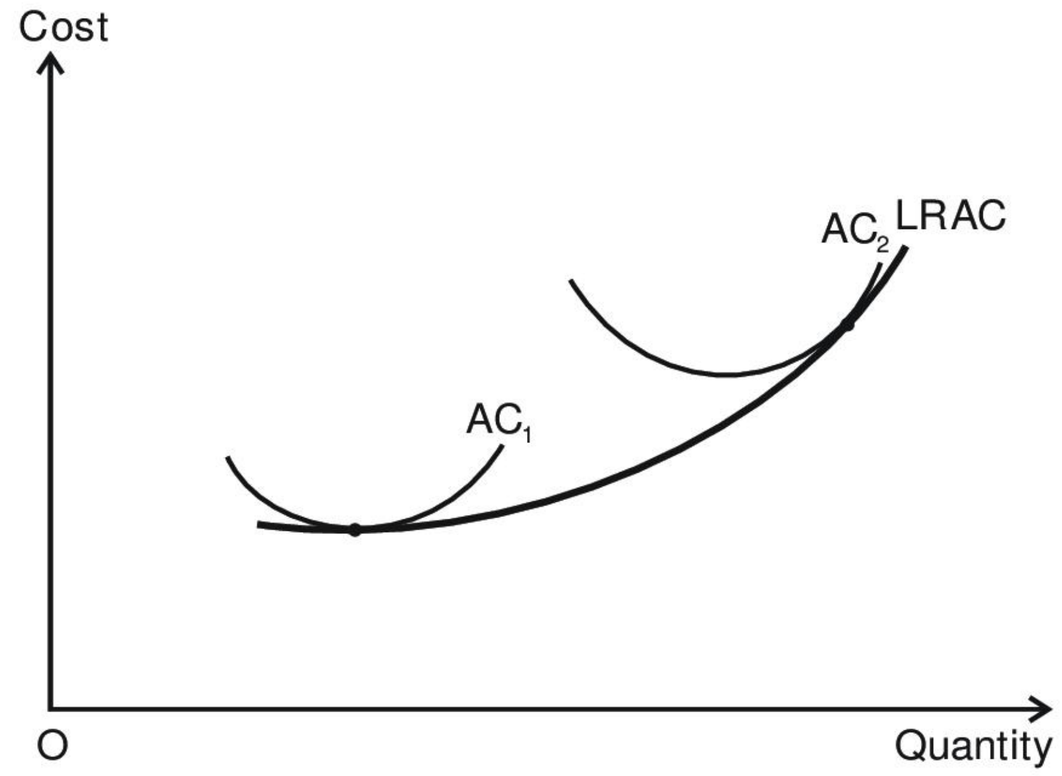
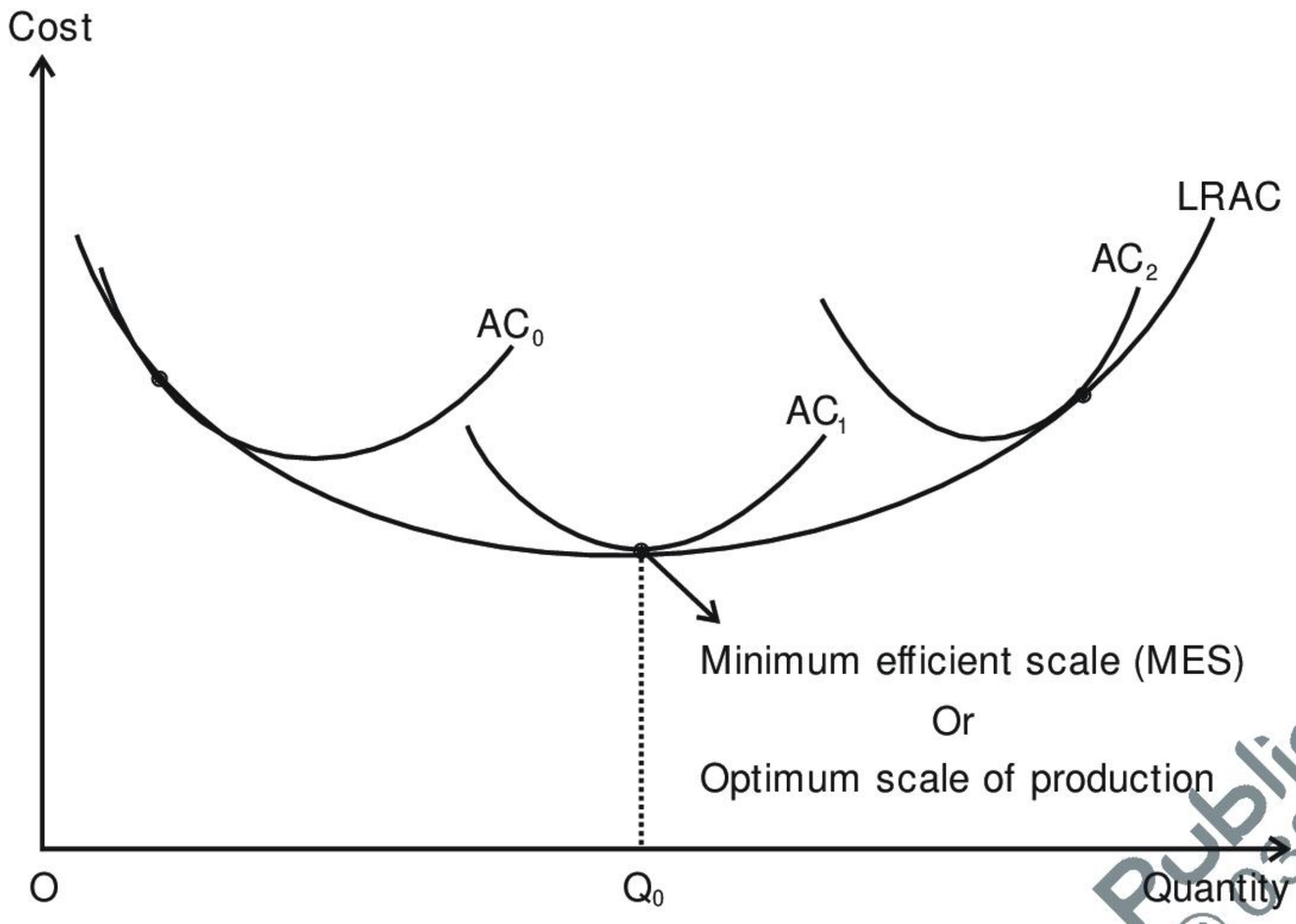


Derivation of Long-run Average Cost (LRAC) from Short-run Average Cost (SRAC) Curves:

The long-run average cost curve can be derived from the short-run average cost curves by drawing a curve that envelopes all given SRAC curves. It is for this reason that a LRAC curve is also called an "envelope curve."



All points on long run average cost are productive efficient and show lowest possible average cost for given volume of output.

Minimum Efficient Scale (MES)/ Optimum Scale of Production:

It is that scale of production at which economies of scale have been exhausted but diseconomies of scale have not yet set in, i.e., the minimum point on the long-run average cost (LRAC) curve.

3. **External economies of scale:**
   External economies of scale are the advantages which accrue to a firm from the growth in the size of the industry. These advantages may be gained by firms of any size. Indeed, a collection of relatively

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small independent firms in a large industry can take advantage of external economies of scale as well.
External economies are especially significant when industries are heavily localized in industrial clusters. In this particular case they are often referred to as economies of concentration.
Examples of external economies of scale include:

a. Labour
The concentration of similar firms in any one area leads to the creation of a local labour force skilled in the various techniques used in the industry. Local colleges develop special courses of training geared to the particular needs of the local industry. The further education colleges in Cornwall and Devon have important travel and tourism departments while the further education college in Witney has a stud and stable husbandry course attracting students from throughout the UK and abroad.

b. Ancillary activities
In areas where there is a high degree of concentration of a particular industry, ancillary industries that cater to the needs of the dominant industry establish themselves. For example, when many participants in the horse racing industry are concentrated in one market, other firms which support the horse racing industry (such as those specializing in the provision of horse feed, vets specializing in the treatment of horses, blacksmiths who provide horse shoes, etc.) are usually also located in the same area.
Even when an industry is dispersed, if it is large enough, ancillary industries will develop. For example, the fertilizer industry supplies farmers throughout the country.

c. Disintegration
Where an industry is heavily localized, there is a tendency for individual firms to specialize in a single process or in the manufacture of a single component. For example, in Lancashire, the production of clothes is broken down into many processes, including spinning, weaving, dyeing, finishing, etc., each carried out by a specialist firm. This development produces among the firms the same sort of advantages which result from the economies of scale in a single large firm. It means, for example, that each individual firm may obtain its components and other requirements at a relatively low cost because they are mass produced for the industry.

d. Co-operation
Regional specialization encourages co-operation among firms. A good example would be of when research centers are established as a joint venture by firms in heavily localized industries. The pottery firms in Stoke-on-Trent, the footwear firms in the East Midlands, and the cotton firms of Lancashire have all set up research centers for their particular industries. The opportunities for formal and informal contact between members of the firms are much greater when the firms themselves are in one locality. The formation of trade societies, the publication of a trade journal, and other such co-operative ventures are more easily stimulated in a localized industry.

e. Commercial facilities
External economies also arise from the fact that the service industries in the area develop a special knowledge of the needs of the industry, and this often leads to the provision of specialized facilities. Banking and insurance firms become acquainted with the particular requirements of the relevant industry and find it worthwhile to provide special facilities. Transport firms may find it economical to develop special equipment (e.g., containers and vehicles) to meet the industry's requirements. Improved infrastructure in the form of better roads and airports may be provided. Again, each firm is a beneficiary, not because the firm itself is large, but because the industry as a whole provides a large demand for these services.

f. Specialized markets
When an industry is large enough, specialized places and facilities to bring buyers and sellers into contact may be developed. An example of this is Lloyds of London, which serves the insurance industry.

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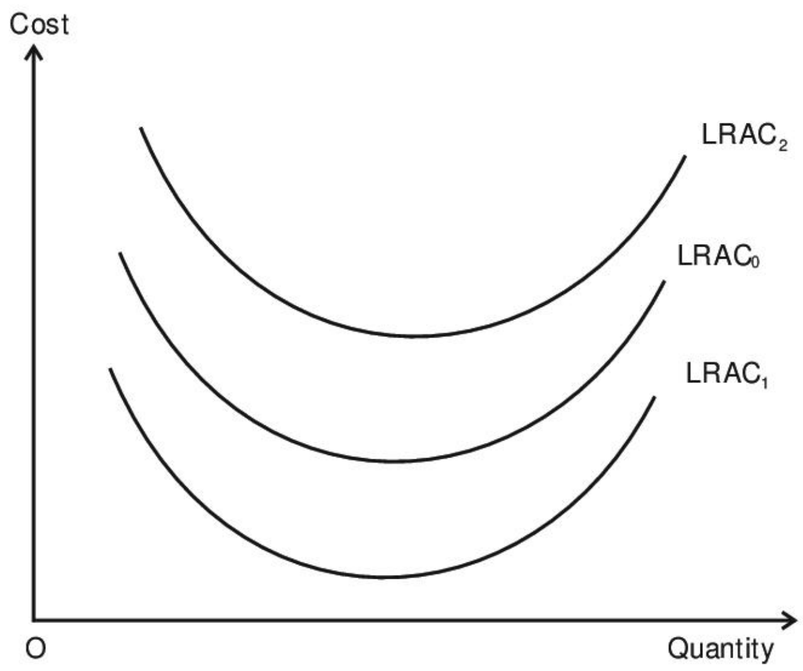
External diseconomies of scale:

A firm may also experience disadvantages as a result of the industry to which it belongs becoming too large. These are referred to as *diseconomies of scale.* For example, a shortage of labour with the appropriate skills may develop so that firms in the industry may find themselves bidding up wages as they try to attract more labour (or hold on to their existing supplies). Increasing demand for raw materials may also bid up prices and cause costs to rise. If the industry is heavily localized, land available for expansion will become increasingly scarce and, hence, more expensive both to purchase and to rent. Transport costs may also rise because of increased congestion. All firms in the industry, whether they are seeking to expand or not, may suffer rising costs as a result of the industry getting too large too quickly.

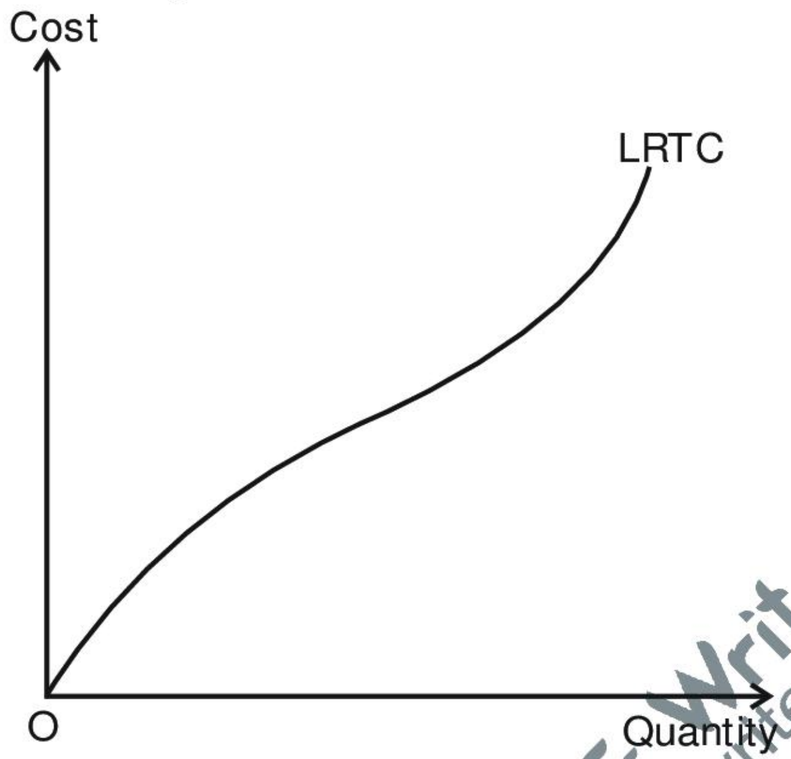
Effect of external economies and diseconomies of scale on LRAC:

LRAC will shift downward if there are external economies of scale and upward if there are external diseconomies of scale.



Long-run Total Cost Curve:

Long run total cost (LRTC) starts from origin as all factors and costs are variable in long run.



Small firms:

Distinction between small and large firms is made on the basis of amount of labour employed, amount of capital invested, volume of sales, level of profits and market share. However, none of these criteria alone is sufficient to determine whether the firm is small or large.

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Reasons for existence Small Firms

Despite the benefits of growth, a large proportion of the firms in any country are small. There are a number of reasons for this.

1. **The small size of the market:** As suggested earlier, this is probably the key influence. If demand for the product is small, a firm producing it cannot be large. Demand for very expensive items, such as luxury yachts, may be small as it may be for individually designed items, such as designer dresses and suits and for repair work.
2. **Preference of consumers:** For some **personal services**, such as hairdressing, consumers prefer small firms. Such firms can cater to their individual requirements and can provide a friendlier and more personal service.
3. **Owner's preference:** The owner (or owners) of a firm may not want it to grow. People who own and run firms have various motives. Some may want to avoid the stress of running a large firm and may be worried that expansion the firm may lead to loss of control.
4. **Flexibility:** Despite the advantages of large firms, small firms may survive because they may be able to adjust to changes in market conditions more quickly. A sole trader, in particular, is likely to be in regular touch with his or her customers and should be able to pick up on changes in their demand. He or she can also take decisions more quickly as there is no need to consult with other owners.
5. **Technical factors:** In some industries, little or no capital is needed. This makes it easy for new firms to set up. It also means that technical economies of scale are not important and small firms do not suffer a cost disadvantage. The lower the barriers to entry, the more small firms there are likely to be, in the industry.
6. **Lack of financial capital:** Some firms may want to expand but they may lack the finance required to do so. As mentioned in the beginning, it may be difficult for sole traders to raise financial capital.
7. **Location:** If a product is relatively heavy in relation to its value, transport costs can form a high proportion of total costs. This can lead to emergence of local, rather than national markets and small firms can supply such markets.
8. **Cooperation between small firms:** For example, small farmers may join to buy seeds, foodstuffs and equipment such as combine harvesters.
9. **Specialization:** Small firms may supply specialist products to, and distribute the products of, larger firms. For instance, a relatively small firm may provide training services for a large accountancy firm.
10. **Government support:** Governments in many countries provide financial help and advice to small firms. This is because small firms provide a high number of jobs, develop the skills of entrepreneurs and have the potential to grow into large firms.

What is the best size for a firm?

The best size for a firm is often called its ***optimum*** size, which is the size where the firm is most efficient and where average costs are at their lowest. At any level of output below that produced at optimum size, average costs are falling and economies of scale are yet to be fully exploited. At any level of output above that produced at optimum, size average costs are rising and diseconomies of scale have set in.

The optimum size for a firm varies from industry to industry. For instance, small firms are best in those industries where quick decisions have to made, such as in advertising, or where variety is required, as in fashion, or where a personal service is needed, as in small retail shops. On the other hand, large firms are best in those industries where much capital is needed, where there is a large demand, and where the economies of scale are to be found, as in the steel industry or the motorcar industry. Thus, there is no single best size that suits all firms.

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PAST PAPER QUESTIONS

(Nov 2012/P43/Q2/a)
With the help of diagrams, analyse how a firm can experience both diminishing returns and economies of scale. [12]

(Nov 2012/P42/Q2/b)
Discuss whether the law of diminishing returns contradicts the concept of economies of scale. [13]

(Nov 2012/P41/Q2/a)
Explain why a firm's short-run average cost curve is usually drawn as a U shape and explain the link between the short-run average cost curve and the long-run average cost curve of a firm. [12]

(June 2011/P42/Q4/a)
Discuss whether it is always advantageous for a firm to grow in size. [12]

(June 2011/P41/Q3/a)
Analyse, with the aid of a diagram, whether there is a link between diminishing marginal returns and economies of scale. [12]

(Nov 2010/P42/Q3)
(a) Consider whether small firms should be encouraged in an economy. [12]
(b) Economic theory states that large firms have lower average costs than small firms. Discuss whether this statement is necessarily true. [13]

(Nov 2010/P41/Q3/a)
Explain what is meant by internal economies of scale, and analyse the link between economies of scale and a firm's long run average cost curve. [12]

(Nov 2009/42/Q2/a)
In 2007 BHP Billiton, a large mining group, made a bid to take over Rio Tinto, the world's third largest mining group. Such a takeover would create the largest producer of copper and aluminum in the world.
Explain whether increasing its scale of production will always reduce a company's costs. [12]

(Nov 2009/P41/Q3/a)
BG is a rapidly growing energy company with operations in 25 countries engaged in the exploration, production and distribution of natural gas and oil. This requires complex chains of physical infrastructure, major investment funds and detailed commercial agreements with different countries.
Explain why economies of scale might be significant in an industry such as gas supply.[12]

(Nov 2008/P4/Q3/a)
Explain how a knowledge of its long-run average costs might be useful to a profit-maximizing firm. [10]

(Nov 2004/P4/Q7/b)
Discuss why in some markets firms remain small while in others the market is dominated by large companies. [13]

(June 2002/P4/Q3/a)
'Huge scale is at the heart of everything the giant US retail company Wal-Mart does. Its biggest stores are ten times the size of an average UK store.'
Explain the advantages that a retail organization might derive from large size.[12]

(Nov 2000)
Many companies, recognizing the increase in environmental awareness among consumers, now advertise that they have invested in research to ensure that their products are environmentally friendly. They have that this will increase the demand for their products and lead to higher profits.
(a) Explain the difference between fixed and variable costs and suggest what might happen to the fixed and variable costs in the above companies in the short run. [12]
(b) Discuss whether the above statement supports the view that it is the producer who dictates what happens in the market with the sole aim of maximizing profits. [13]

(June 2000)
'Economic theory suggests that a firm's average cost curve is U-shaped in both the short and long run.'
Explain this statement and consider whether it is always true. [25]

(Nov 1998)
The Coffee Marketing Board of Uganda controls 50% of the country's export of coffee. Its main asset is a large central processing and storage unit located in the heart of an industry area which enables

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economies of scale and a benefits of the above arrangement. [25]

(June 1998)

(a) Explain the terms 'diminishing returns' and 'economies of scale' and distinguish between the two. [15]

(b) To what extent do economies of scale influence the size of a firm?[10]

(Nov 1997)

(a) Explain how economies of scale affect the production costs of a firm.[13]

(June 1997/a)

Marks and Spencer is a major international retailer. Its October 1995 magazine states 'We put years of painstaking research into the development of our products. Coupled with the need to offer customers the finest quality food the company has a long standing awareness and interest in animal welfare—an issue which has become a major public concern. The whole chain from farm to table is constantly monitored and controlled.' Distinguish between fixed and variable costs and effects the above policy is likely to have on those costs in the company. [15]

(June 1995/a)

A cosmetic company decided to change its policy to make sure that in the future the ingredients it used were environmentally friendly and had not been tested on animals. This policy involved expensive initial research before the company benefited from increased demand and lower unit costs.

Explain the differences between fixed costs and variable costs of the cosmetic company.[12]

(Nov 1994/a)

Fixed cost, variable cost and marginal cost are discussed in economics texts. Explain the relationship between fixed cost, variable cost and marginal cost.[8]

(June 1994)

(a) Why do some firms grow in size? [15]

(b) Why do other firms remain small? [10]

(June 1993/a)

Explain the distinction between the law of diminishing returns and the concept of returns to scale.[10]

(June 1992/a)

Analyse with examples the nature and likely benefits of economies of scale of large manufacturing companies.[12]

(Nov 1991)

Would you accept the belief that large firms are more cost-efficient than small firms? [15]

(June 1991)

(a) How would you measure the size of a firm? [5]

(b) What cost advantages might a firm gain when it increases in size?[6]

(c) What revenue advantages might a firm gain when it increases in size?[6]

(d) Do you believe that cost or revenue advantages are more important in influencing the size of firms in the UK? [8]

(Nov 1990)

Distinguish between a firm's fixed costs and its variable costs. [6]

(Nov 1990)

(a) Comment on the cost advantages which large supermarkets have over small retailers. [12]

(b) Given the advantages you describe, account for the continued existence of small retailers. [13]

(Unknown)

Large organizations have lower average costs than small organizations. They are therefore more efficient and should be welcomed. How far do you support this argument?[25]

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UNIT 3

Rules of Firm's Behaviour

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Revenue:

- total, average and marginal

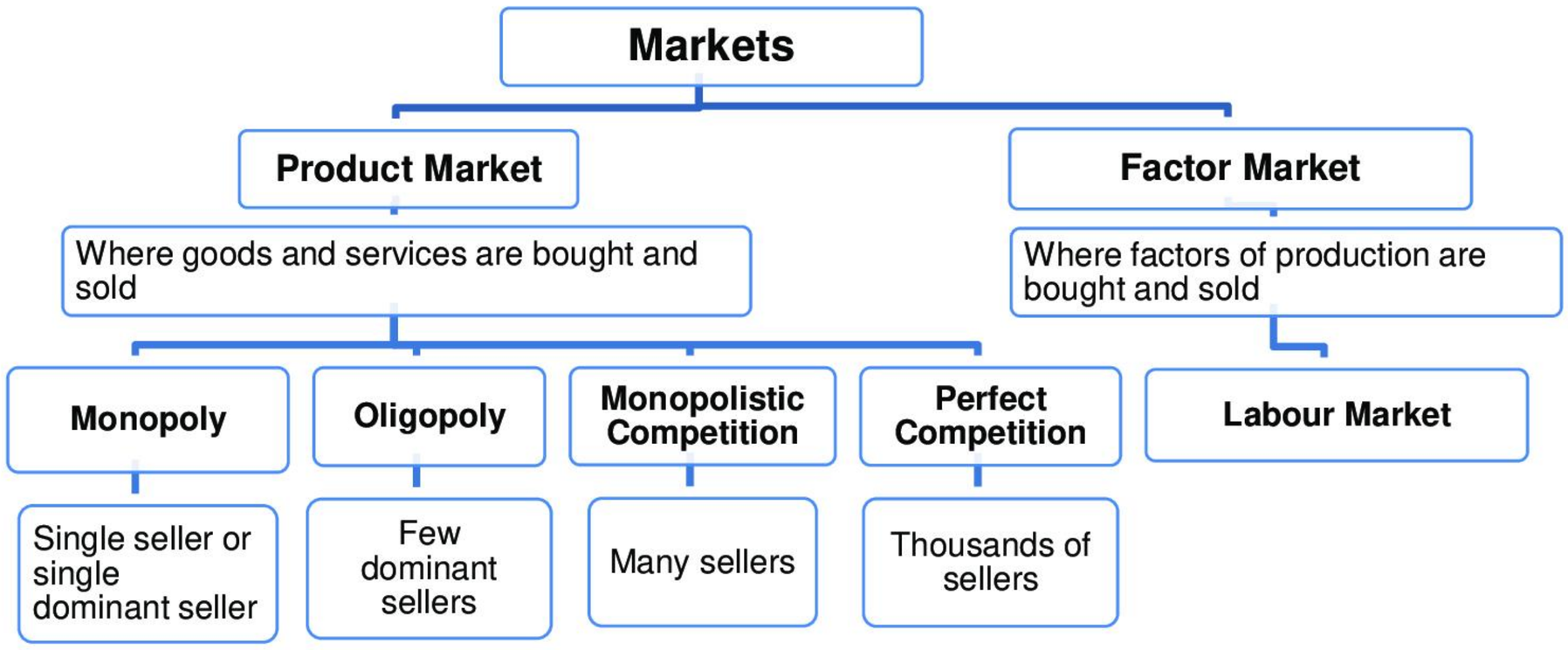
b. Short-run and long-run continuity

- exit of firms in long-run
- shutdown in short-run

c. Profit:

- normal and abnormal (supernormal)
- total, marginal and average profits
- traditional profit maximising objective of firm

Unit 3 Rules Of Firm's Behaviour



In order to understand market structures we will first see what rules firms have to follow according to their specific market structures. There are four basic rules:

- Profit-maximization rule
- Exit rule
- Shut-down rule
- Types of profits rule

1. Traditional Economic theory of Profit Maximization

Profit is the excess of revenue over cost. There will be three different types of profits a firm is concerned with.

- Marginal profit
- Total profit
- Average profit

	Marginal Profit	Total Profit	Average Profit
Definition	The profit gained from selling an additional unit of the product	The profit gained from selling all units of the product	The profit per unit sold
Formula	= MR−MC	= ∑(MR−MC) = TR−TC =Average profit × Qty	$= \frac{\text{TotalProfit}}{\text{Qty}}$ = AR−AC

A firm maximizes its total profits at the output from which MC = MR. As long as a firm's MR > MC (i.e., each extra unit of output costs less than the revenue it generates), it will benefit from marginal profit. This can be explained by the following table:

Q	MR	MC	Marginal Profit = MR−MC	Total Profit = ∑(MR−MC)
1	10	10	0	0
2	10	8	+2	+2
3	10	6	+4	+6
4	10	4	+6	+12
5	10	6	+4	+16
6	10	8	+2	+18
7	10	10	0	+18
8	10	12	−2	+16

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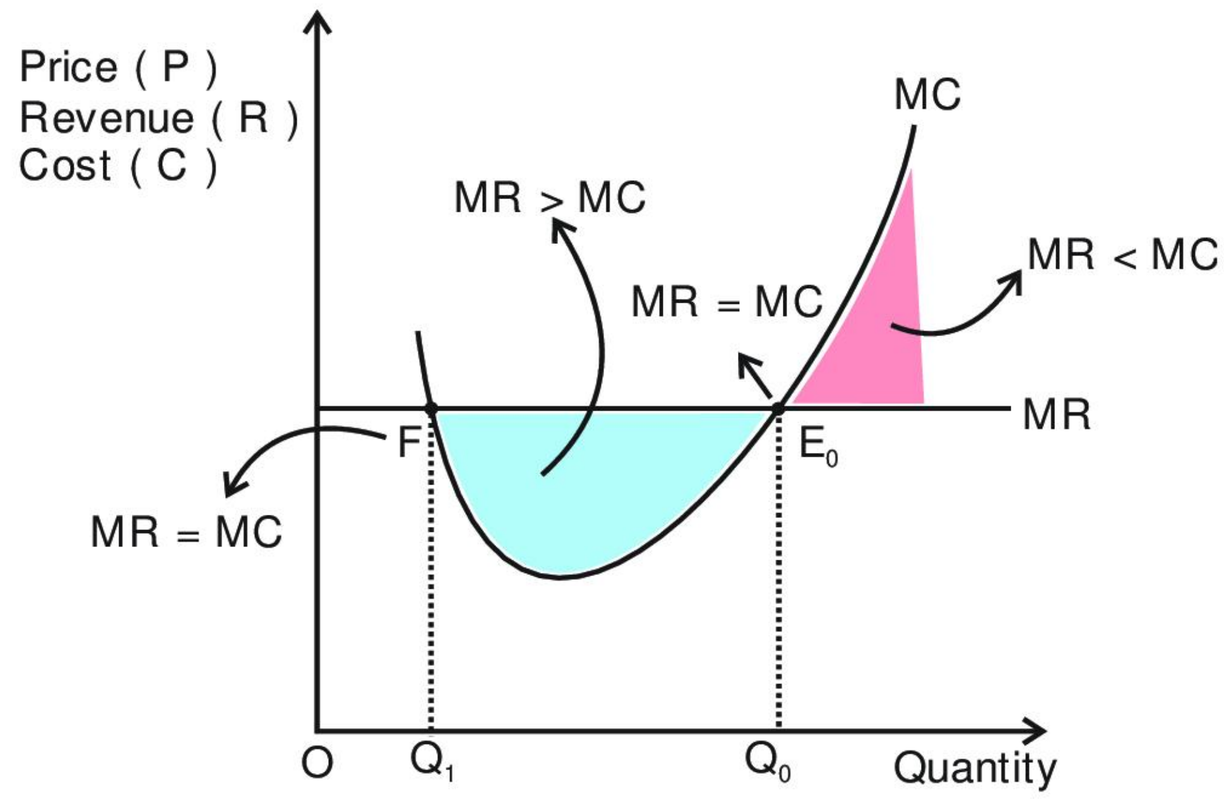
Marginal profit increases up to the 4thunit, after which it begins falling. However, total profit increases up till the 7th unit, at which marginal profit is zero. After the 7th unit there is a marginal loss and, therefore, total profit falls from 18 to 16.



A firm producing below outputQ1 is sacrificing potential profits. It can raise total profit by raising its output. When the firm is producing at Q_0, where MR=MC, it has absorbed all profit margins available, and is producing at total profit-maximization output. Any increase in output aboveQ_0 will incur a marginal loss for each additional unit produced, consequently reducing total profit. It will be better to cut back output to Q_0, where MR=MC, to maximize total profit.

MR is also equal to MC at point F, as shown in the diagram above. However, Q_1 is not profit-maximizing output, as an increase in output beyond Q_1 still generates marginal profits.

Hence, the profit-maximizing point is where MR = MC, provided that, at that point, the MC curve is rising (has a positive gradient).

2 Business continuity rules

The goal of a firm is to maximize profits or minimize losses. The firm can achieve this goal by following two rules. First, the firm should operate, if at all, at the level of output where marginal revenue equals marginal cost (MR=MC). Second, the firm should shut down if it cannot cover its losses in the long run.

a. Shut-Down Rule:

In economics, a firm will choose to shutdown production when the revenue received from the sale of the goods or services produced cannot even cover the variable costs of production. In this situation, the firm will experience a higher loss when it produces, compared to not producing at all.

A firm should compare the profits from operating to those realized if it shut down, and select the option that produces the greater profit or lower loss. A firm that is shut down is generating zero revenue and incurring no variable costs. However, the firm still incurs its fixed costs. An operating firm is generating revenue, incurring variable costs, and paying fixed costs. Both options will lead to a loss, but whichever one leads to a lower loss should be chosen. The firm should continue to operate if TR ≥ VC. The difference between revenue, TR, and variable costs, VC, is the contribution towards offsetting fixed costs, and any positive contribution is better than none. Thus, if TR ≥ VC, then the firm should continue to operate. If TR < VC, the firm should shut down. By not producing, the firm loses only the payments made to cover fixed costs.

Alternatively, shutdown occurs if average revenue (AR) is below average variable cost (AVC)at the profit-maximizing level of output[i.e., (MR=MC)].

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b. Exit Rule:

In the long run a firm can enter and leave an industry. Therefore, as long as a firm is making profits, it will continue to produce. However, when TR < TC or AR < AC(i.e., the firm is making losses), the firm will leave the industry. This is known as the exit rule.
Alternatively, the long-run decision is based on the relationship between the price P(AR) and long-run average costs (LRAC). If P(AR) ≥ LRAC, then the firm will not exit the industry. If P(AR)< LRAC, then the firm will exit the industry.

In the long run a firm operates at the point where marginal revenue equals long-run marginal costs—but only if it decides to remain in the industry.
Example:

TR	VC	FC	TC	Profit/Loss	Contribution (TR-VC) if TR<TC and TR>VC	Short run	Long run
100,000	50,000	40,000	90,000	+10,000	-	√	√
90,000	50,000	40,000	90,000	0	-	√	√
80,000	50,000	40,000	90,000	-10,000	+30,000	√	Exit
60,000	50,000	40,000	90,000	-30,000	+10,000	√	Exit
50,000	50,000	40,000	90,000	-40,000	0	√	Exit
45,000	50,000	40,000	90,000	-45,000	-	Shut down	Exit

Short-run shutdown compared to long-run exit

Shutdown	Exit
Short-run decision	Long-run decision
TR < VC or AR < AVC	TR < TC or AR < AC
Firm stays in the industry but stops production	Firm leaves industry (Exit)

A decision to shut down means that the firm is temporarily suspending production; it does not mean that the firm is going out of business (exiting the industry). If market conditions improve, due to prices increasing or production costs falling, the firm can resume production. Shutting down is a short-run decision. A firm that has shut down is not producing, but it still retains its capital assets; however, the firm cannot leave the industry or avoid its fixed costs in the short run.

A firm will, however, not choose to incur losses indefinitely. In the long run, the firm will have to decide whether to continue its business or to leave the industry and pursue profits elsewhere. Exit is a long-term decision. A firm that has exited an industry has avoided all commitments and freed all of its capital for use in more profitable enterprises. A firm that exits an industry earns no revenue and incurs no costs, neither fixed nor variable.

3 Types of Profits

Profit			
Accounting Profit	**Economic Profit**		
= Revenue – Expenses	= Revenue – Cost (Expenses + Opp. Cost) = Accounting profit – Opportunity cost		
	Abnormal/Supernormal Profit	**Normal Profit**	**Economic Loss/Subnormal Profit**
	TR > TC	TR = TC	TR < TC
	AR > AC	AR = AC	AR < AC
	Profits over and above what a firm could have earned somewhere else (i.e., its opportunity cost).	Profits equal to what a firm could had earned somewhere else (i.e., opportunity cost).	Profits less than what a firm could had earned somewhere else (i.e., opportunity cost).

Example:

If Expenses = 100,000 Opportunity Cost = 40,000 Total Cost = 140,000

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Total Revenue (TR)	Accounting Profit	Economic Profit	Types Of Profits
200,000	+100,000	+60,000	Abnormal profits(TR>TC)
140,000	+40,000	0	Normal Profits(TR = TC)
130,000	+30,000	–10,000	Economic Loss(TR<TC)

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Past Paper Questions

(Nov 2010/P43/Q2/a)
Explain the significance of the distinction between fixed and variable cost for the pricing and output decisions of a firm. [12]
(June 2006/P4/Q7/b)
The price of a firm's product is above the average total cost. Discuss whether the firm should stop production if its price falls. [15]

(Nov 1997/a)
Discuss whether average variable cost is significant when considering.
(i) the output to be produced by, and
(ii) the profit of, a firm.
(Nov 1995)
The increasing cost of renting premises in a popular shopping centre has caused many small businesses to close.
(a) Do you agree that according to economic theory a business will always close if its total revenue does not cover its total cost? [12]
(b) Discuss the possible reasons why larger businesses could remain open when faced with such an increase in costs [13]
(Nov 1994/b)
How might the firm use these concepts in order to determine what level of output to produce? [17]
(Nov 1990/b)
Why is it that a firm will continue its production as long as its average revenue exceeds its average variable cost? [07]

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UNIT 4

Perfect Competition

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Features

- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:

- total, average and marginal revenue

c. Short-run price and output determination

- normal, abnormal and subnormal profits
- types of losses and shutdown in short-run
- short-run supply curve of a firm

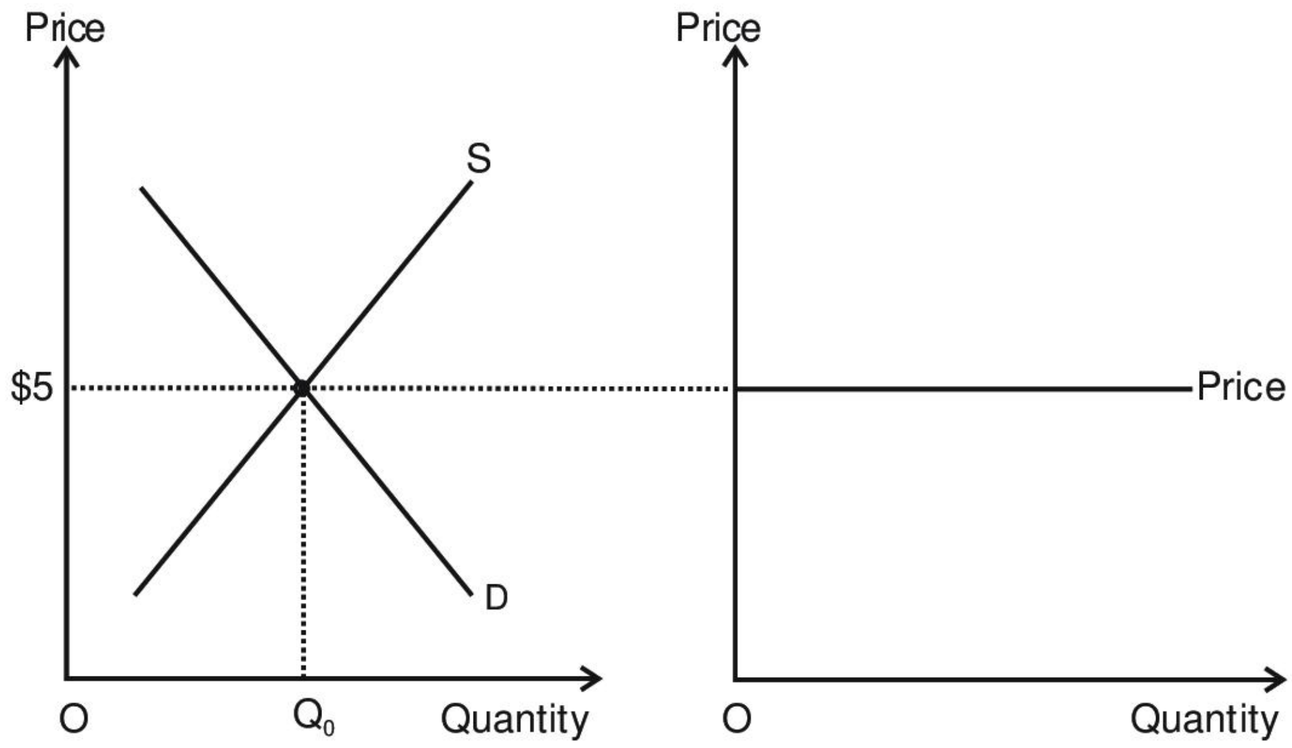
d. Long-run price and output determination:

- abnormal to normal profits
- losses to normal profits

Unit 4 Perfect Competition

Characteristics

1. There are **many buyers** in the market, but they cannot control prices. The price is fixed in the market through the forces of demand and supply. No matter how much has been purchased, price is always constant. Buyers are said to be price-takers.



2. There are **many sellers** in the market. Like the buyers, they too cannot control price. They are also price-takers. The sellers are usually small firms. Price is determined at say, $10, where goods will be bought. If the seller offers a lower price, then he will incur a loss, and if he sells at a higher price, there will be no demand. In other words, he is powerless in determining price, but he can set the quantity he wants to sell.
3. The **goods are homogenous** and not differentiated—they are identical. The consumer cannot differentiate whether the good comes from producer A, B, or C. Advertising is totally absent in this market.
4. There must be **free entry to and exit from** the market. If the industry is making profits, then new firms will enter the market. Otherwise, some firms will leave the market. No restriction is imposed. All the four characteristics represent pure competition, but for perfect competition to exist, five other characteristics must be present.
5. Both producers and consumers should have **perfect knowledge** about the market situation—i.e., they know the prevailing prices in all the markets.
6. There must be **mobility of factors of production**. This means that factor of production are able to easily switch between different uses. There are no barriers to mobility. As for land, it must have alternative uses.
7. Size of firms is **small**.
8. **Market share** is negligible.
9. Perfect and many **substitutes**.
10. In long-run: always **normal profits**.
11. **Productive efficiency**.
12. **Allocative efficiency**.
13. Doesn't exist in the real world (**ideal market structure**).
14. Demand curve is **perfectly elastic**.
15. **Example**: commodity markets for wheat, rice, or cotton.
16. There must be **no transport costs**. It is assumed that all firms are situated close to one another and are very close to the market.
17. There must be **independence in decision making**. There will be no external forces that will influence the decision of buyers and sellers (i.e., they make their own decisions).
18. There is **no preferential treatment**. All buyers and sellers are treated equally.

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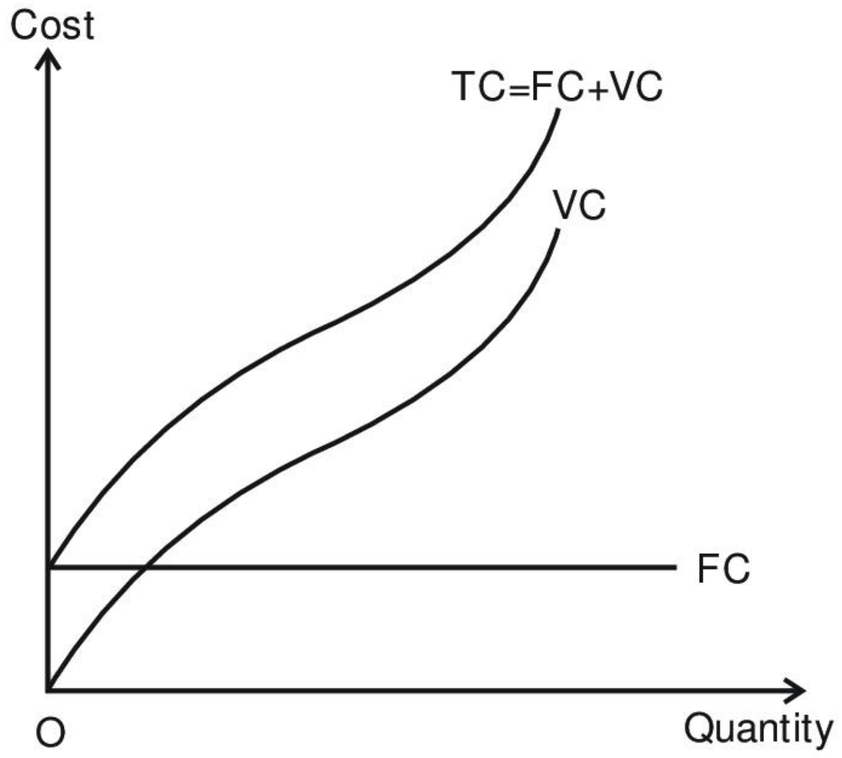
Price and Output Determination in Short Run

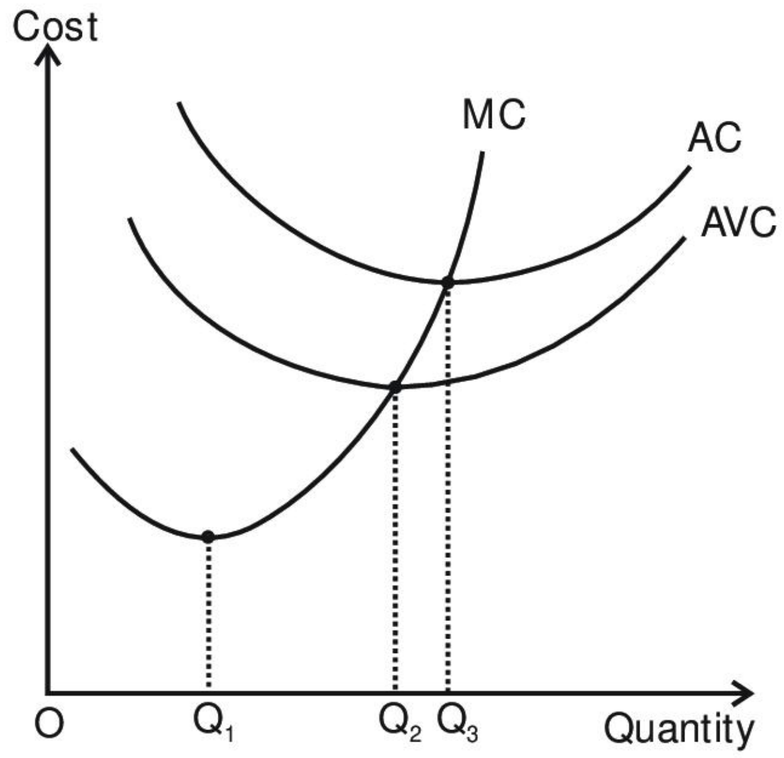
To analyze price and output determination in perfect competition, we have to understand the nature and behavior of the cost and revenue curves of the firms that operate within that market.

Cost Curves:

1) Total cost curves:



2) Marginal and Average cost curves:



NOTE: MC must pass through the minimum points(turning points) of AVC and ATC.

Revenue Curves under Perfect Competition

As firms are quantity sellers and price-takers in perfect competition, they will be able to sell whatever quantities they want to sell at the given market price. Let us consider a firm selling a homogenous product in perfect competition at the constant market price of $5. Here are its revenues and various quantities of sale.

P	Q	TR = P × Q	$MR=\frac{\Delta TR}{\Delta Q}$	$AR=\frac{TR}{Q}$
$5	0	0	–	–
$5	1	5	5	5
$5	2	10	5	5
$5	3	15	5	5
$5	4	20	5	5

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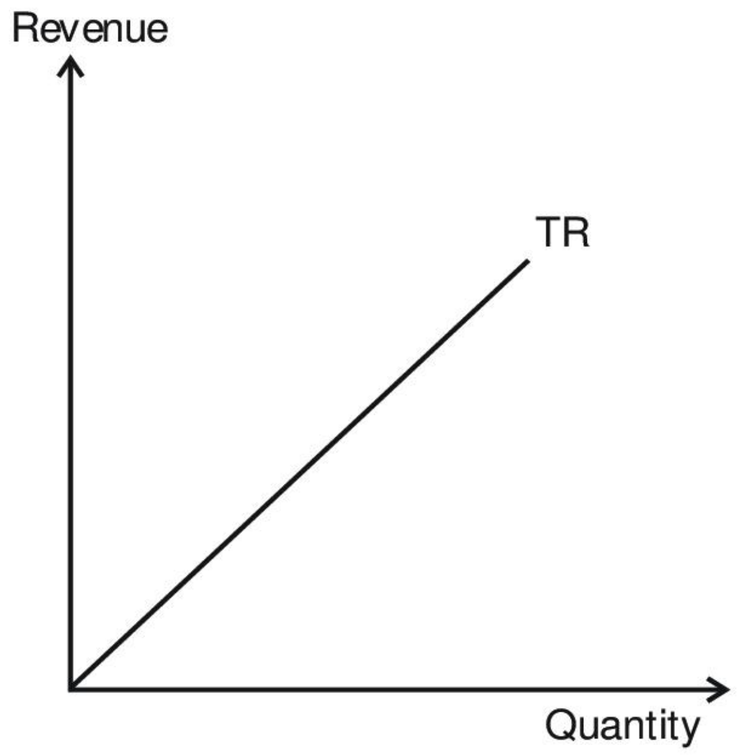
Total Revenue (TR)

- Total revenue is the money received from the sales of goods and services (i.e., TR=P × Q).
- In perfect competition, the total revenue curve is a straight line from the origin, because of the assumption that the firm is a price-taker. Price is fixed through market forces. The buyers and sellers cannot control prices. They can, however, establish the quantity traded.



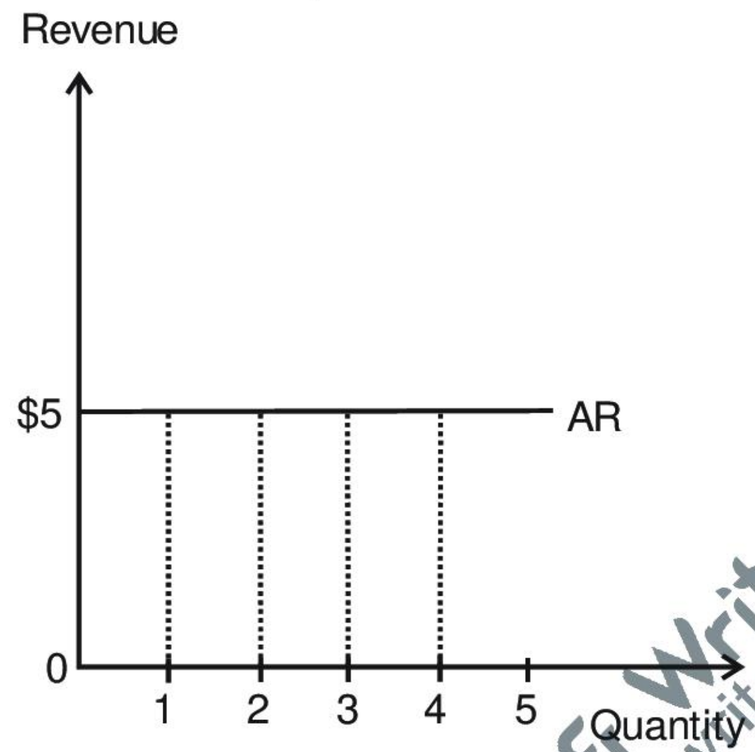
Average Revenue (AR)

- Average revenue is the total revenue per unit of output sold (i.e., AR= $\frac{TR}{Q}$.)
- It is very important to note that the average revenue curve is also the demand curve for the product. In this case, it is a horizontal straight line (i.e., demand is perfectly elastic).
- AR = P; this will always be true because:

$$AR=\frac{TR}{Q} = \frac{P \times Q}{Q} = P$$

- Example: Given that total revenue is $1000 and the output sold is 20 units, what is the average revenue?

$$AR = \frac{TR}{Q} = \$\frac{1000}{20} = \$50$$



Marginal Revenue (MR)

- Marginal revenue (or incremental revenue) can be defined as the additional revenue earned as a result of selling one more unit of output.
- The shape of the marginal revenue curve is a horizontal straight line.
- Formula:

$MR = TR_n – TR_{n-1}$ (where n refers to the number of units sold) or

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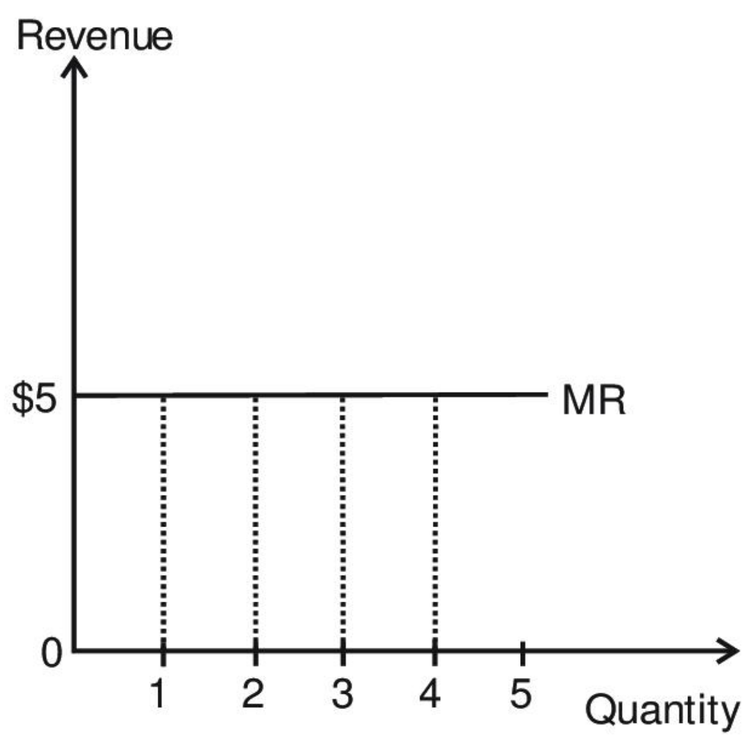
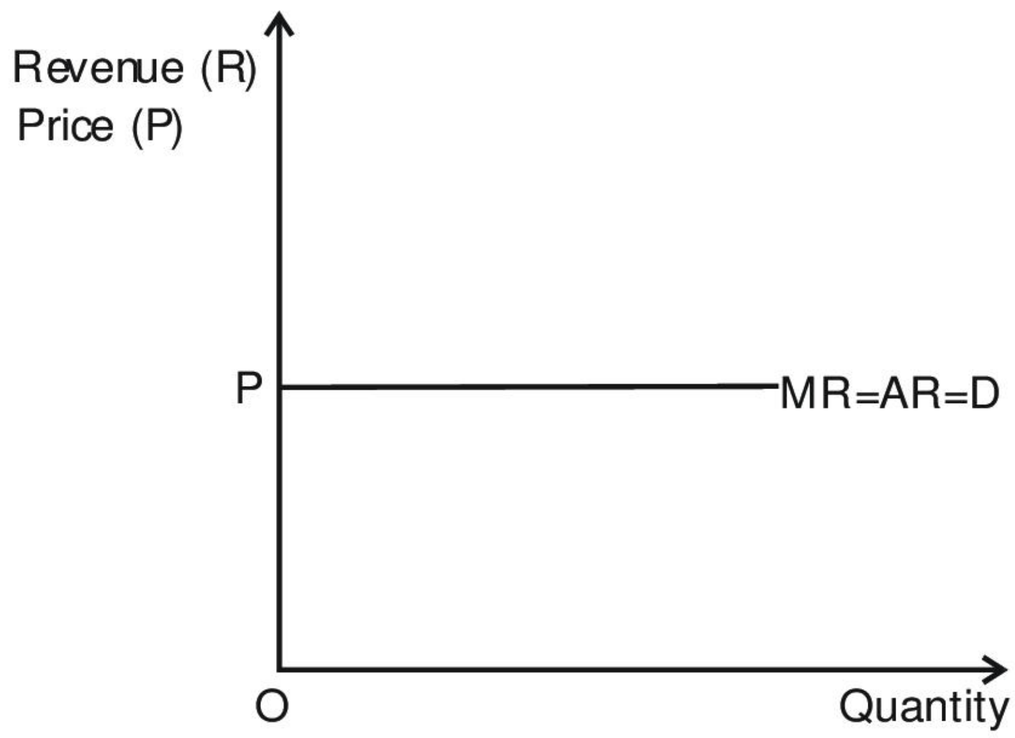
$$MR=\frac{\Delta TR}{\Delta Q}$$



Relationship between MR, AR, P, and the Demand curve

In perfect competition, price is equal to average revenue and marginal revenue (a horizontal straight line). This is because of the assumption that the firm is a price-taker.



The triple equality of P = MR = AR only holds true in perfect competition. In all other market structures, MR does not equate to AR. However, P = MR is always true in all market structures.

Short-run price and output determination:

There are two ways to analyze the equilibrium point of a firm:

a) Total cost/Total revenue method
b) Marginal cost/marginal revenue method

a) Total Cost-Total Revenue Method

- Total revenue can be defined as revenue earned as a result of selling good and services.
- Total cost can be defined as the entire cost incurred as a result of producing goods and services. Total cost will include implicit and explicit costs and normal profit (opportunity cost).
- If total revenue is greater than total cost, profit can be maximized when the distance (or difference) between TR and TC is greatest, as shown below.

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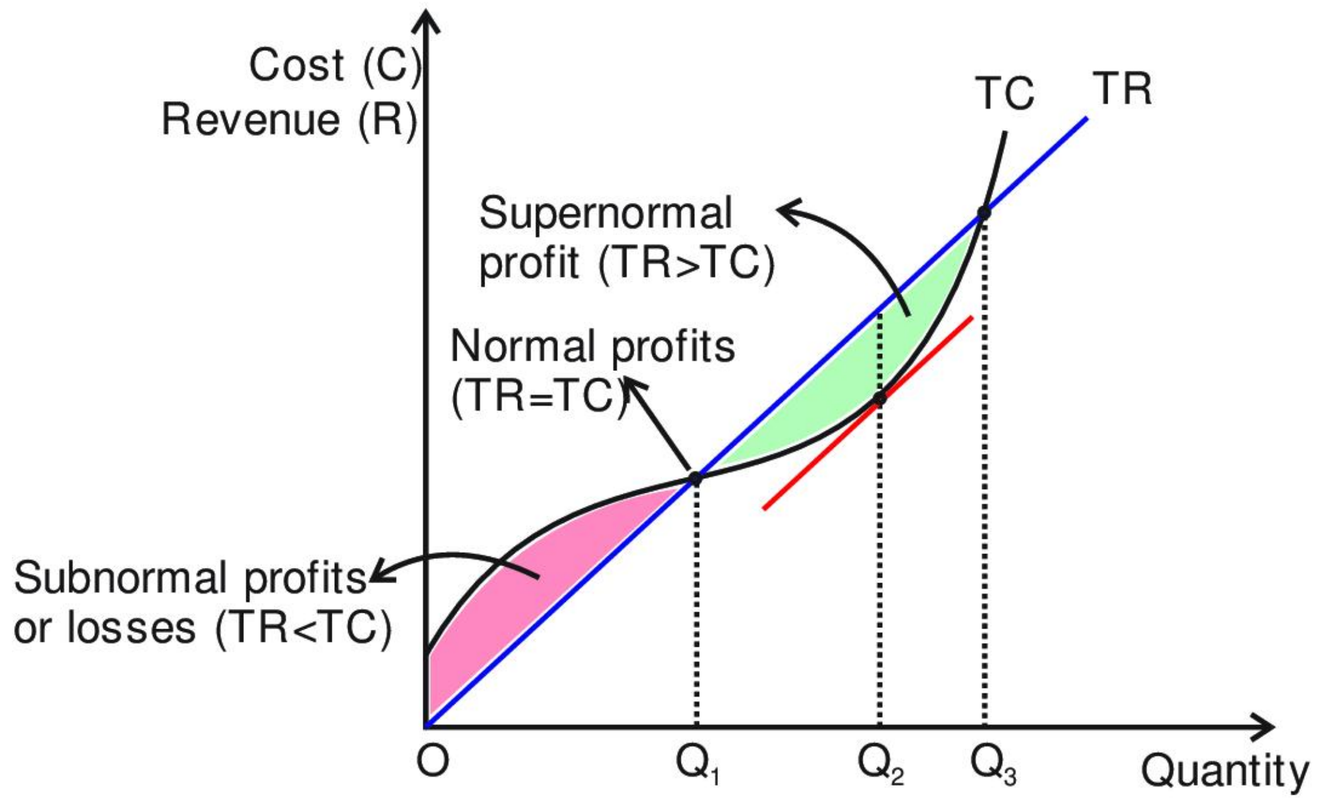
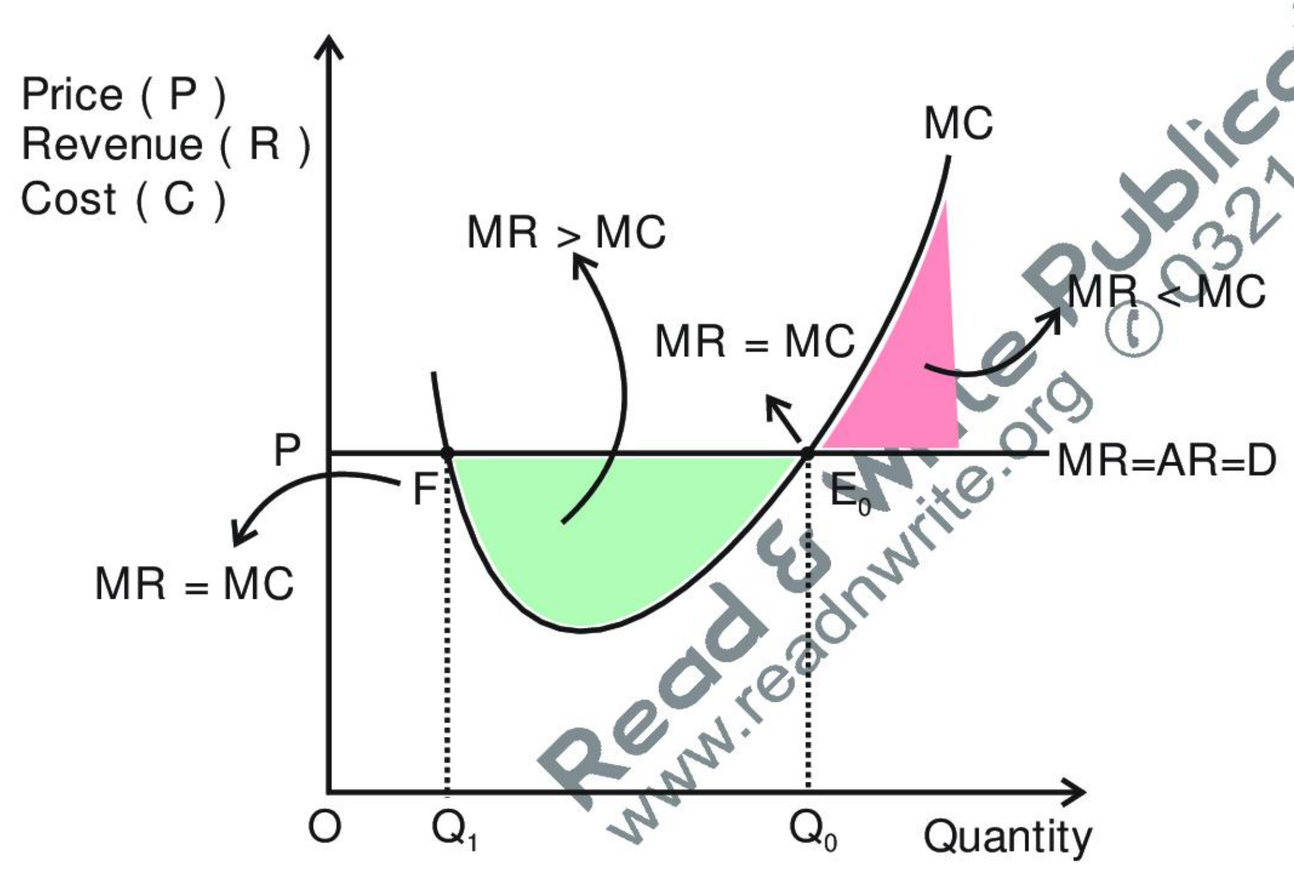


- If total cost (TC) is greater than total revenue (TR), then losses can be minimized when the distance (or difference) between the TC and TR curves is at a minimum.
- In mathematical language, the profit-maximization (or loss-minimization) point is where tangents to the TC and TR curve are parallel to each other. The tangent to the TC curve determines MC, and the tangent to the TR curve determines MR, and when both are parallel, it signifies that MR=MC.
- Maximum profit is earned when the firm is producing Q_2 units of output.
- For any quantity produced below Q_1, TR<TC, leading to a loss.
- For any quantity produced between Q_1 & Q_3 TR>TC, leading to a profit.
- For exact quantities produced either Q_1 or Q_3, TR=TC, meaning that the firm is earning normal profits.

b) Marginal Cost-Marginal Revenue Method

- Marginal cost (or incremental cost) can be defined as an addition to total cost as a result of producing one more unit of output.
- Marginal revenue or incremental revenue can be defined as the addition to total revenue as a result of selling one more unit of output.
- If MR >MC, the firm should increase output to make additional profit.
- If MR <MC, the firm should reduce output to ensure the additional profit is not reduced.
- Therefore, the level of output that will maximize profits or minimize losses is where MC = MR and where the MC curve cuts the MR curve from below.



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A firm producing below output Q_1 is sacrificing potential profits. It can raise total profit by raising its output. When the firm is producing at Q_0, where MR=MC, it has absorbed all profit margins available, and is producing at total profit-maximizing output. Any increase in output beyond Q_0 will incur a marginal loss for every additional unit produced, consequently reducing total profit. It will be better to cut output back to Q_0, where MR=MC, to maximize total profit.

MR=MC is also true for point F, as shown in the diagram above. However, Q_1 is not profit-maximizing output, as an increase in output beyond Q_1 still generates marginal profits.

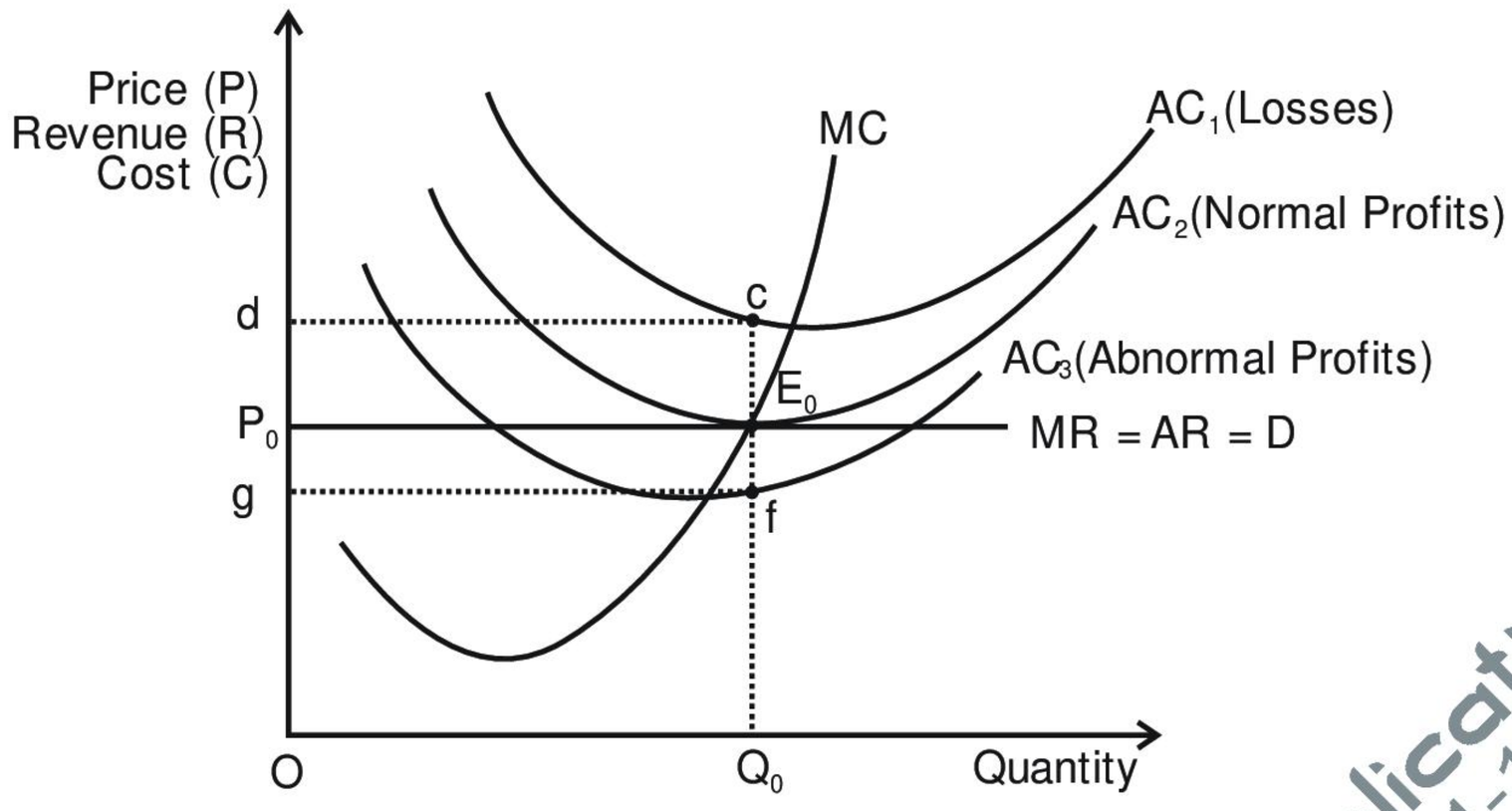
Hence, the profit-maximizing point is where MR = MC, provided that, at that point,the MC curve is rising (has a positive gradient).

Types and Determination of Profit

When a firm is said to be at equilibrium in the short run, there are three profits levels:

a) Supernormal or abnormal profits
b) Normal profits
c) Subnormal profits or losses

In the figure below, when the firm is earning supernormal profits, average revenue is greater than average cost. When the firm earns normal profits, average revenue is equal to average cost. Finally, when the firm earns subnormal profits, average cost is greater than average revenue.



In all three cases, marginal cost must be equal to marginal revenue.

a) Normal profits:

- Minimum level of profit required to keep the firm in the business or resources in their present use.
- Profits equal the opportunity cost of the firm—the opportunity cost in this case being the extra profit a firm could have earned from any other venture.
- When AR = AC or TR=TC at the profit-maximizing output.

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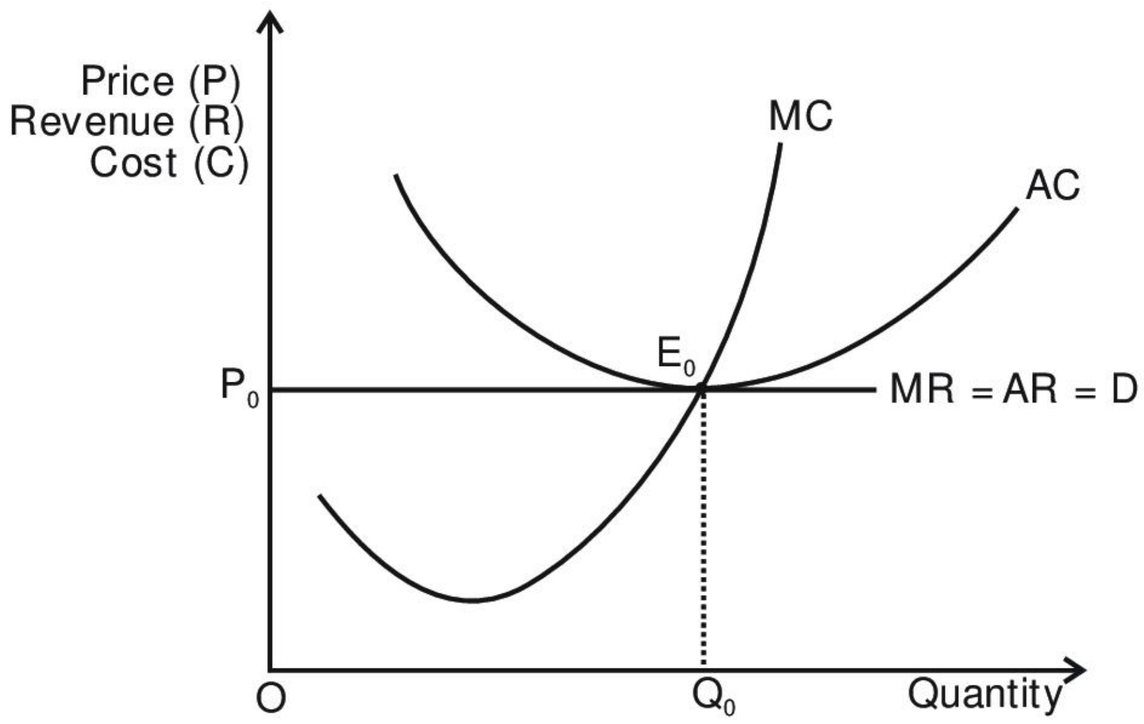


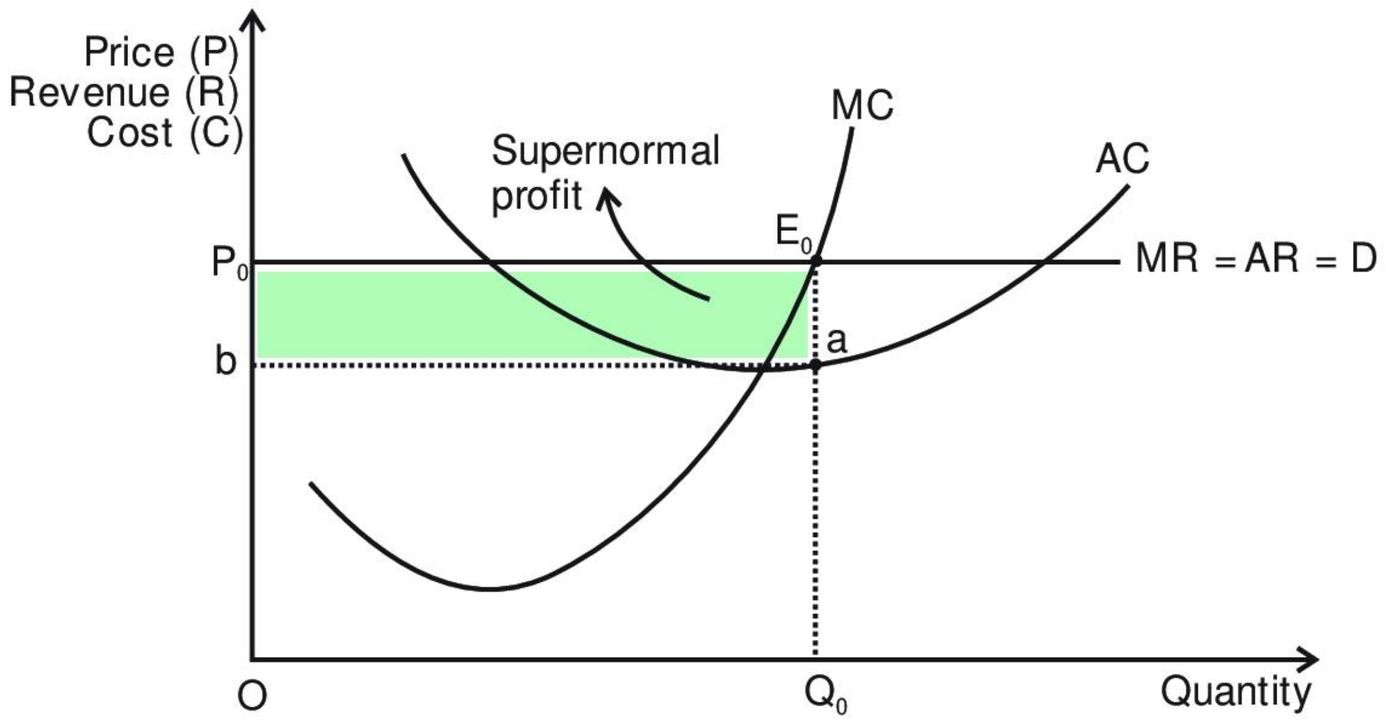
According to the above diagram:

– The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
– At profit-maximizing output Q_0:
  AR = E_0Q_0
  AC = E_0Q_0

Hence, when AC = AR, the firm is earning normal profits.

b) Supernormal profits:

– Profits over and above what is required to keep the firm in the business or resources in their present use.
– Profits exceed the opportunity cost of the firm—the opportunity cost in this case being the extra profit a firm could have earned from any other venture.
– When AR > AC or TR > TC at the profit-maximizing output.



According to above diagram:

– The profit-maximizing point is where MC = MR at point E_0, with market price of P_0 and output Q_0.
– At profit-maximizing output Q_0:
  AR = $E_0Q_0 = 0P_0$
  AC = $aQ_0 = 0b$

Hence, as AR> AC, the firm is earning abnormal profits.

Average abnormal profits = AR − AC = $E_0Q_0 - aQ_0 = E_0a$
Quantity = $0Q_0 = ab = P_0E_0$
Total abnormal profits = Average abnormal profit × Quantity = $ab \times E_0a = P_0E_0ab$

Alternatively:

Total Revenue = AR × Q = $E_0Q_0 \times 0Q_0 = 0P_0E_0Q_0$
Total Cost = AC × Q = $aQ_0 \times 0Q_0 = 0baQ_0$

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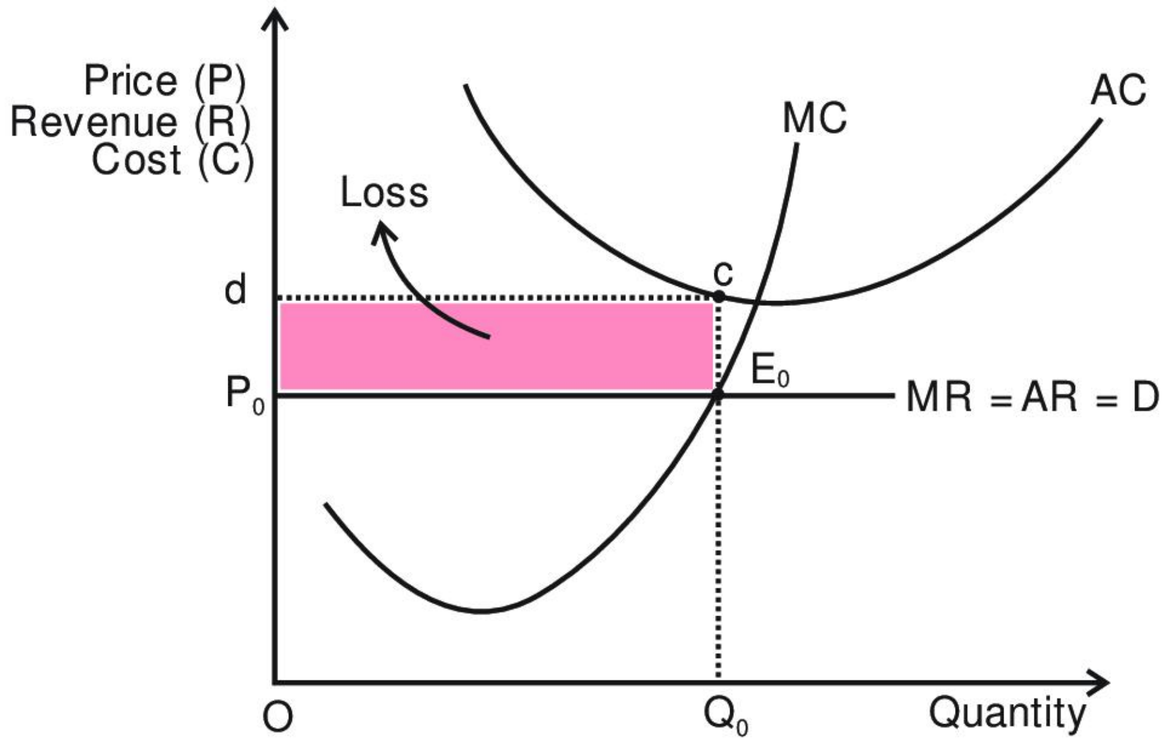
Total Abnormal Profit = TR – TC = $0P_0E_0Q_0 - 0baQ_0 = P_0E_0ab$

c) Losses or Subnormal profits:

- Profits below than what is required to keep the firm in the business or resources in their present use.
- Profits below than the opportunity cost of the firm (i.e., a firm could has earned from any other venture).
- When AR < AC or TR < TC at the profit maximizing output.



According to above diagram:

- Loss minimization point is where MC = MR at point E_0 with market price of P_0 and output Q_0.
- At Loss minimization Q_0

  $AR = E_0Q_0 = 0P_0$

  $AC = cQ_0 = 0d$

Hence AC > AR and there are subnormal profits or losses.

$\text{Average Loss} = AC - AR = cQ_0 - E_0Q_0 = E_0c$

$\text{Quantity} = 0Q_0 = ab = cd = P_0E_0$

$\text{Total Loss} = \text{Average Loss} \times \text{Quantity} = E_0c \times ab = P_0E_0cd$

Alternatively:

$\text{Total Revenue} = AR \times Q = E_0Q_0 \times 0Q_0 = 0P_0E_0Q_0$

$\text{Total Cost} = AC \times Q = cQ_0 \times 0Q_0 = 0dcQ_0$

$\text{Total Loss} = TC - TR = 0dcQ_0 - 0P_0E_0Q_0 = P_0E_0cd$

The Shutdown case of a perfectly competitive firm

In the short run, should the firm cease production if average cost is more than average revenue in the short run? The answer depends on the average variable cost. The firm should continue production as long as average revenue is greater than or equal to average variable cost. Whether a firm covers or does not cover its variable cost in short-run will determine the type of losses which can of three types:

I. With contribution
II. Without contribution
III. Shut-down

1. Losses with contribution:

With reference the figure, if the firm ceases production, the loss would be dcfg which is actually the total fixed cost. The difference between the average cost and average variable cost will give us the average fixed cost (i.e.,cf=dg). Hence the total fixed cost would be AFC × Q = dcfg. If the firm continues production, the loss incurred would be less, i.e.,dcE_0P_0 because the total revenue will recover part of the total fixed cost.

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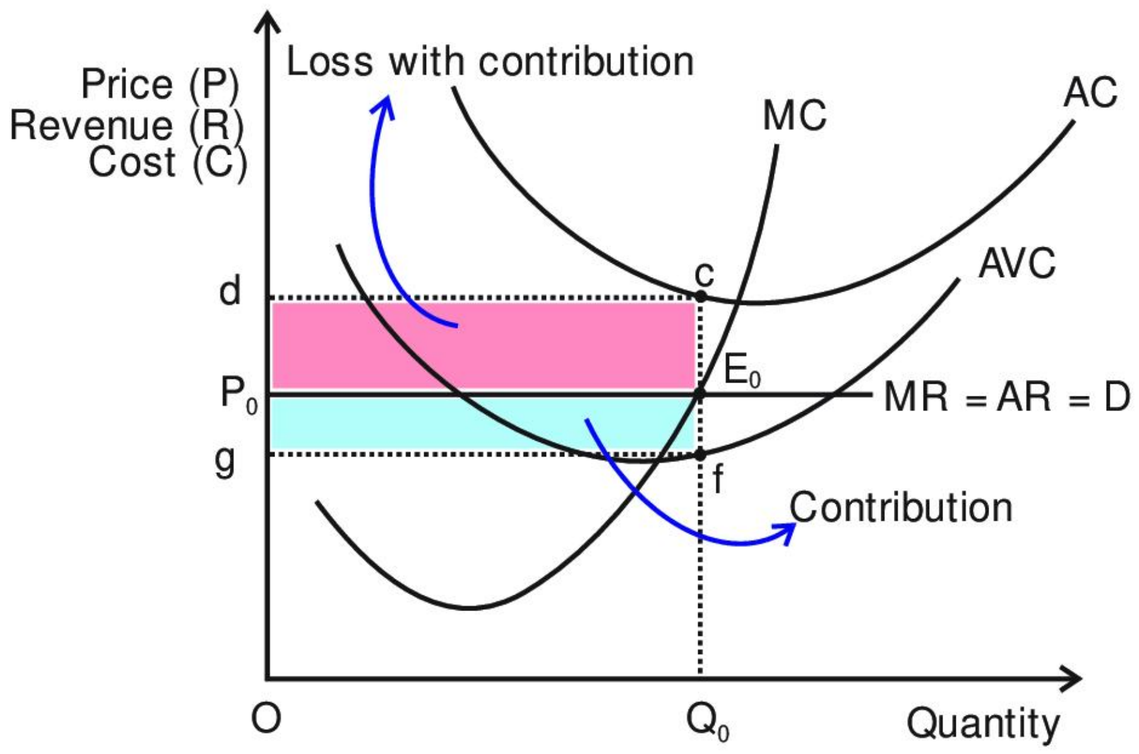
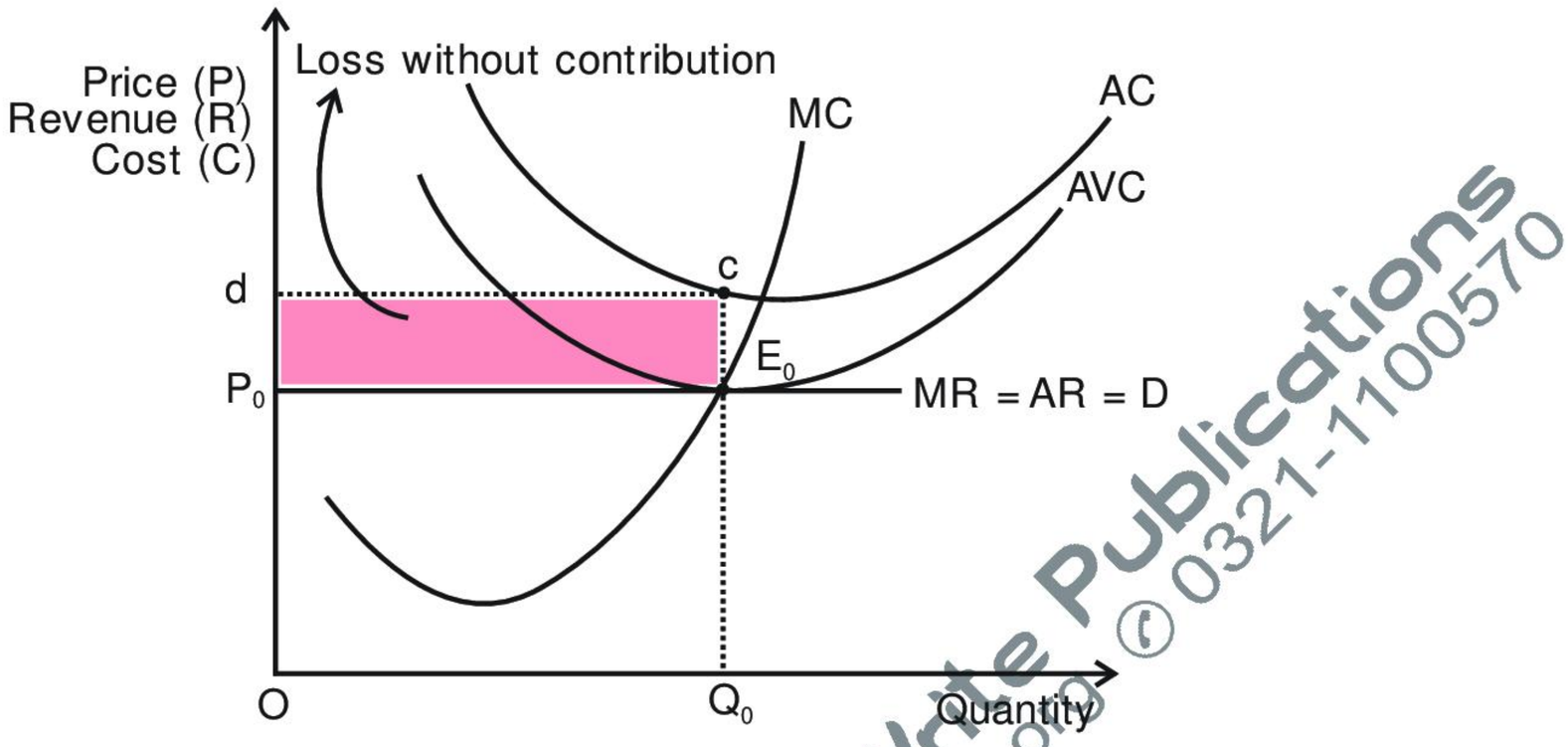


What is more important is that the firm can recover its variable costs. With reference to the figure, the average variable cost (AVC) is fQ_0 and the average revenue is E_0Q_0. This would mean that the firm is able to pay the wages of the labour and all other variable factors such as prices of raw-material, intermediate products and other expendable expenses. In fact, it can also recover part of its average fixed cost E_0f out of cf. Hence, the firm should continue production because average revenue is greater than average variable cost.

2. Losses without (Zero) contribution:

With reference to the figure, average variable cost is equal to the average revenue. This means that the firm is able to pay for its variable factors but not its fixed factors. As long as variable costs can be met, the firm should continue production. This is because variable factors are more important than fixed factors. In the short run, fixed factors cannot be altered and the emphasis is therefore on the variable factors. As long as the wages of labour and cost of raw materials are sufficiently covered, the firm should continue production.



3. Shutdown:

With reference to the figure, the firm should cease production because it cannot cover its variable costs. Wages of labour are not paid and this would definitely mean that the firm is incurring heavy losses. In addition, the producer is also unable the costs of his raw materials. This will definitely affect the credit worthiness of the producers and no worker would be willing to work for him free of charge. Hence, to avoid further losses, the firm must shut down its business (i.e., average revenue is less than average variable cost).

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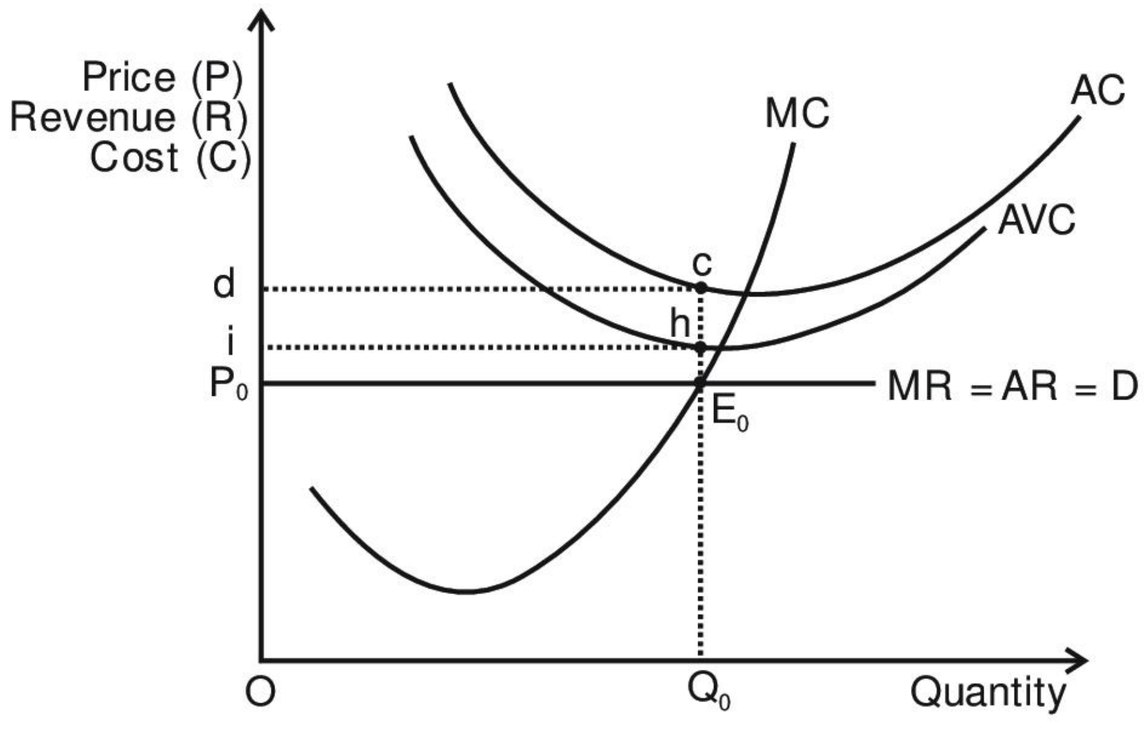
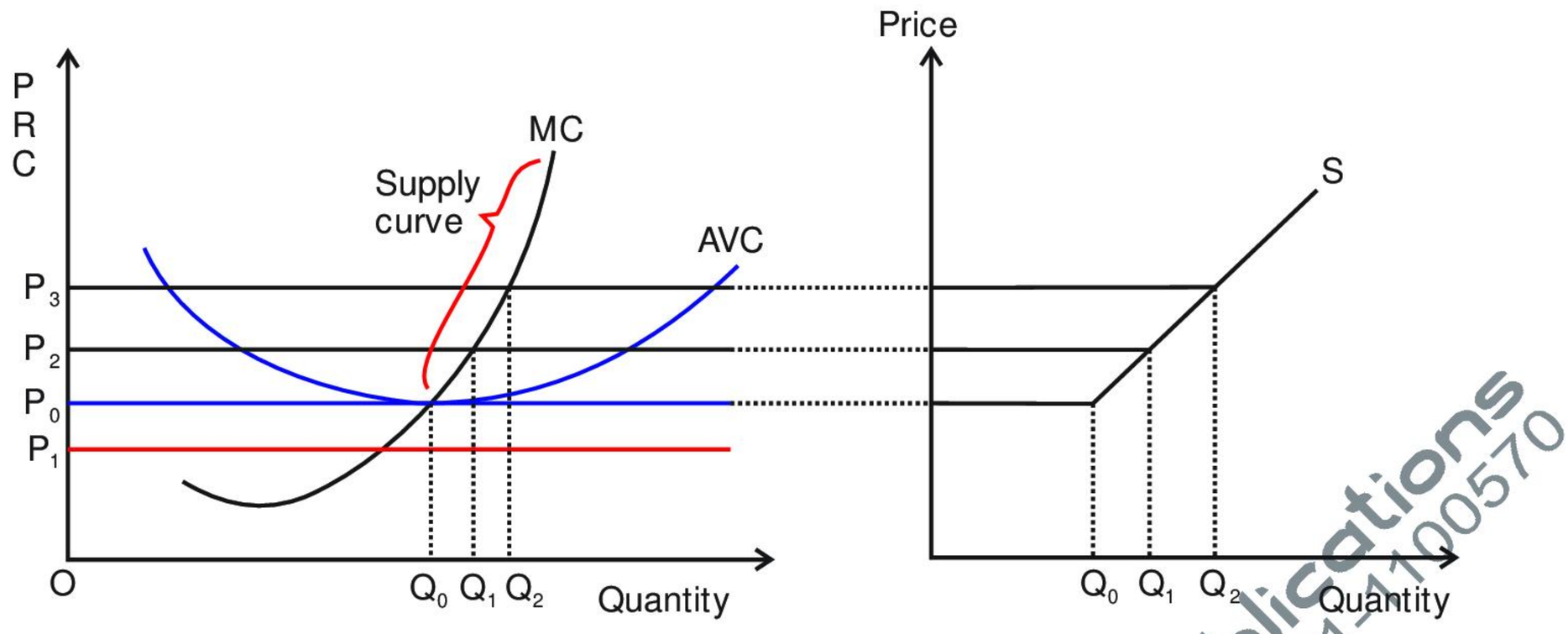


Derivation of the supply curve of a perfectly competitive industry in the short run

– The firm can supply at any quantity with a given price in the market. The firm will start supplying when price is greater than or equal to average variable cost, which is also called the shut down point. The supply curve of a perfectly competitive firm is the rising portion of the marginal cost curve above the average variable cost or the shut down point.



– With reference to the figure, when price is at P, the firm will supply at this price level, i.e., output Q, because average variable cost is equal to average revenue. When price increases to P_2 or P_3, the firm will increase supply because average revenue is greater than average variable cost. Assuming that price is at P_1, average variable cost is greater than average revenue (losses) and the firm will cease supply. In fact, it must cease production.
– Hence, the supply curve of a perfectly competitive firm is the rising portion of the marginal cost curve above the average variable cost or the shut down point.

Price and Output Determination in Long Run

In the short run, there are three types of profits, namely, subnormal, normal, and supernormal. However, in the long run, the industry can only earn normal profits, because of the assumption of free entry into and exit from the industry, i.e., no barriers to entry.

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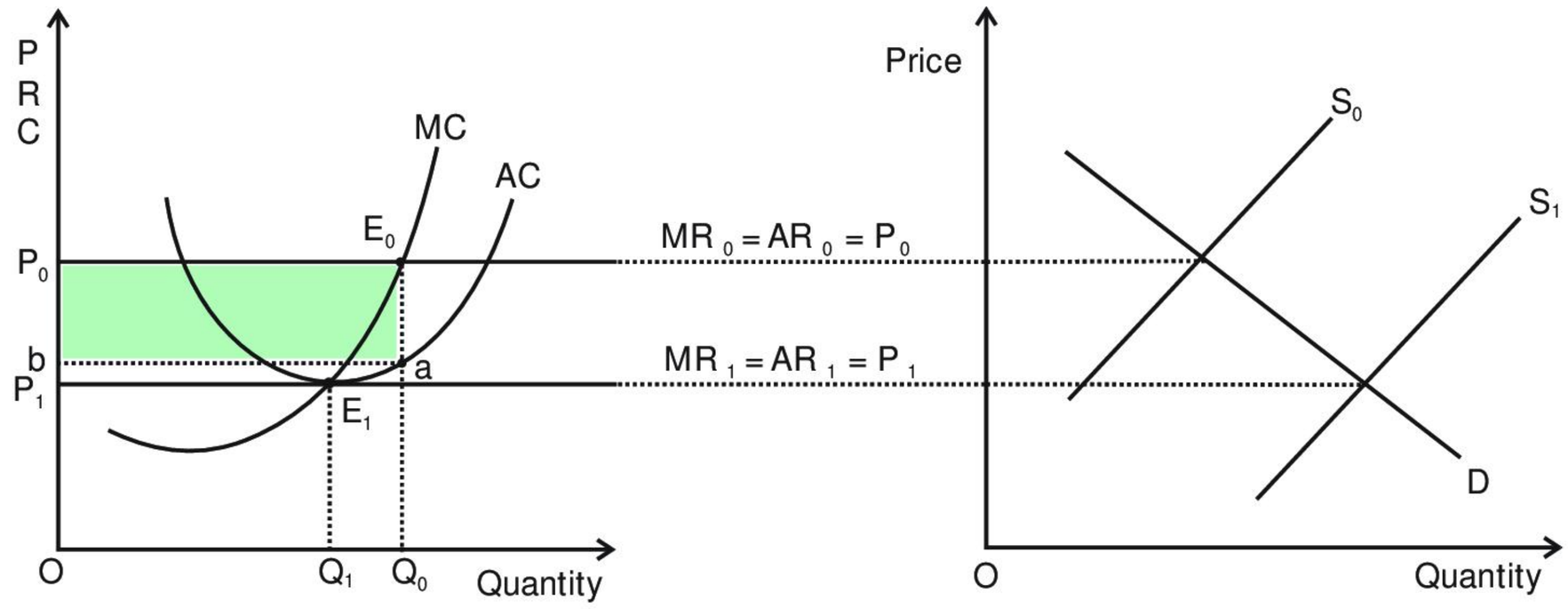
1. Supernormal profits to normal profits:

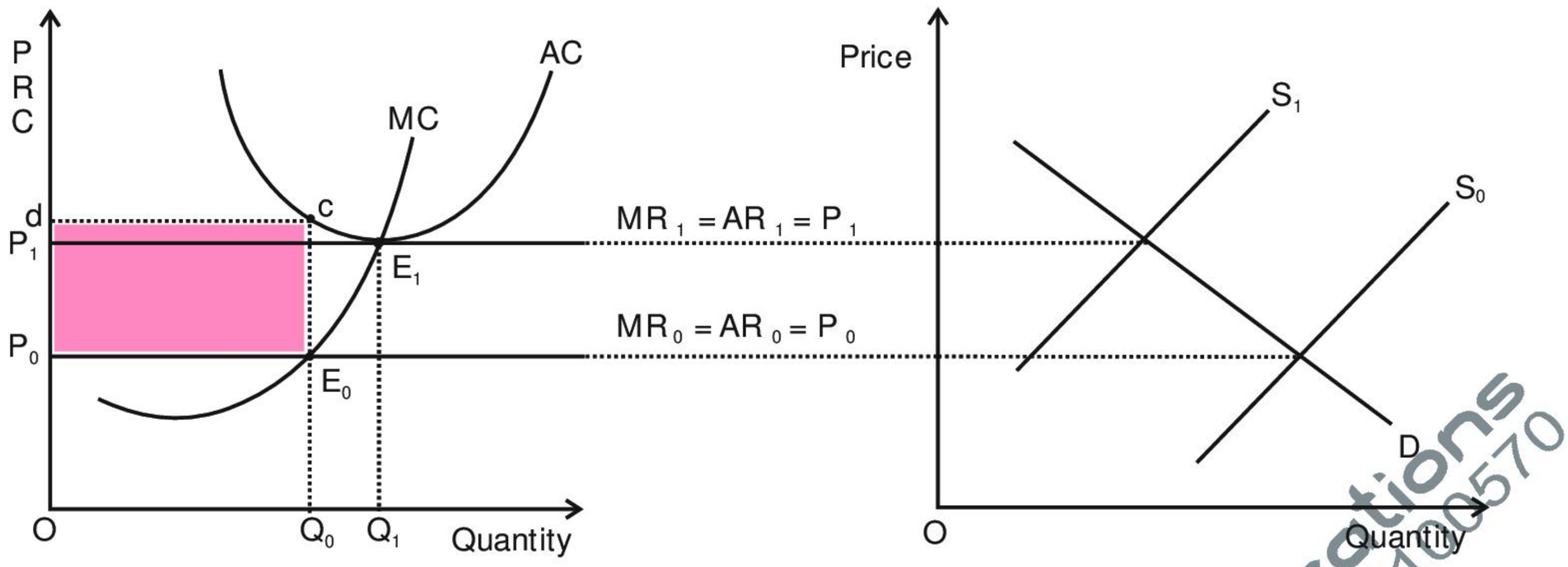


With reference to the figure, when the industry is earning supernormal profits P_0E_0ab, there will be two reactions:

a) New firms will enter the industry.
b) Existing firms will expand production, i.e., increase supply. Total supply will increase.

With demand being constant, supply will rise from S_0 to S_1, price will fall to P_1, i.e., AR_1whereby the industry would be earning normal profits only .i.e. AC = AR = MC = MR = P.

2. Losses to normal profits:



- With reference to the figure, when the industry is facing losses P_0E_0cd, the some firms will leave the industry while some will reduce production.
- As a result, supply will fall to S_1 and this would push the price to P_1, i.e., AR_1 whereby only normal profits can be earned.

Conclusion

In the long run, only normal profits can be earned. In the long run AR = MR = MC = AC =P.

Is Perfect Competition a realistic model?

Perfect competition can only be found in the agricultural sector, dealing with mainly primary products. The stock exchange is another possible example. No other fields correspond to the perfectly competitive industry. It must be noted that the characteristics of perfect competition are unrealistic. It is a simple theoretical model so as to study market structures. By using the perfect competition model, we can investigate the more realistic models of monopoly, oligopoly and monopolistic competition (i.e., imperfect competition).

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UNIT 5

Monopoly

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Features

- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:

- total, average and marginal revenue
- relation between elasticity and revenue

c. Short-run price and output determination

- normal, abnormal and subnormal profits
- types of losses and shutdown in short-run

d. Long-run price and output determination:

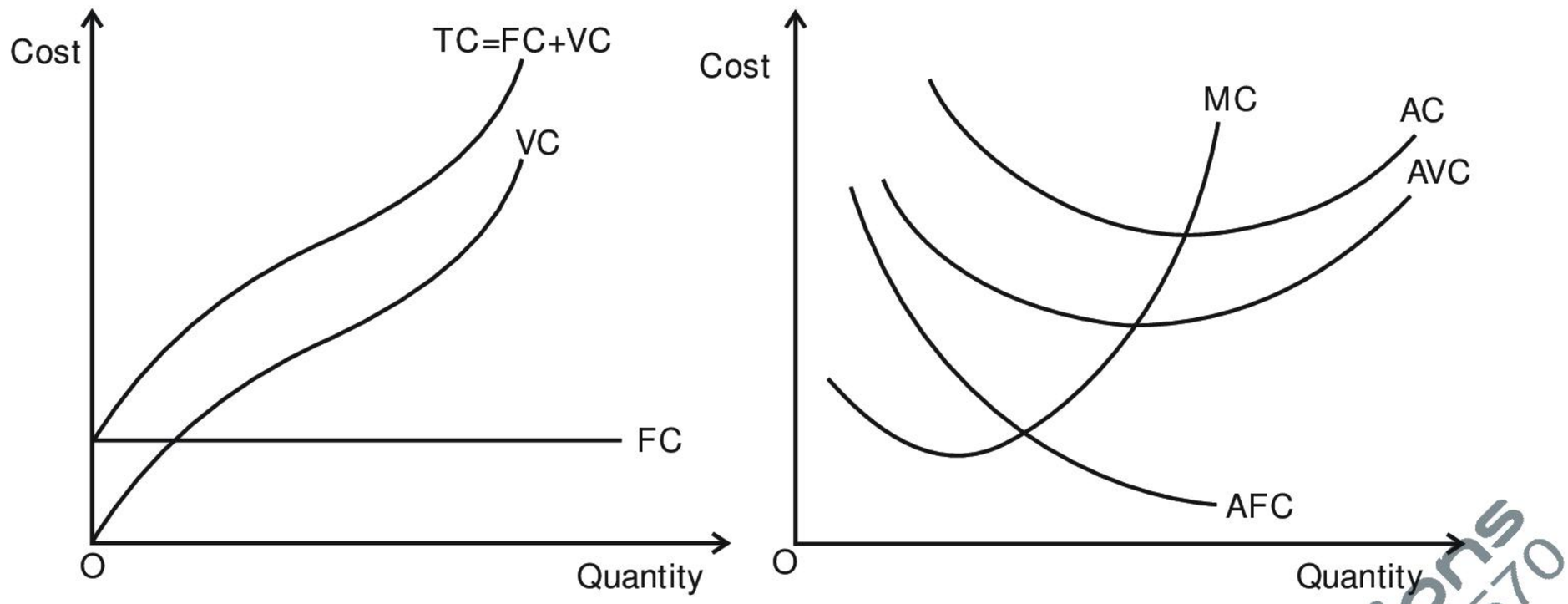
- barriers to entry
- natural monopoly

Unit 5 Monopoly

Characteristics

1. Single seller or one seller having more than 25% market share.
2. Usually large size; may be of small size (e.g., local monopolies).
3. 100% market share or more than 25%.
4. Unique product with no close substitutes.
5. Buyers have imperfect knowledge.
6. Inelastic demand curve.
7. Firm = Industry (Firm's demand = Market demand; Firm's supply = Market supply).
8. High barriers to entry and exit. In fact, entry is blocked.
9. Price maker and quantity seller, but cannot do both simultaneously.
10. Can use price discrimination to reap profits.
11. Does not always earn supernormal profits.
12. No difference between the long-run situation and short-run situation of a monopoly.
13. May or may not be productively efficient.
14. Profit-maximizing monopolies are allocatively inefficient.
15. MR is not equal to AR but AR is equal to price. Rather, MR is less than AR. AR is equal to price due to the downward-sloping demand curve and the characteristic of a monopoly being a price maker.

Cost Curves



Revenue Curves

Unlike perfect competition, in which firms are price-takers and can sell whatever quantities they want at on-going prices, a monopoly represents the whole industry. That's why a monopoly faces a downward-sloping demand curve. (It should be noted that the demand curve in perfect competition was perfectly elastic.) Hence, a monopoly cannot sell more unless it reduces its price to attract more customers and persuade existing ones to buy more. Let us illustrate the case for a monopoly with a downward-sloping demand curve. Its TR, MR, and AR will be as follows:

P	Q	TR	MR	AR
6	1	6	6	6
5	2	10	4	5
4	3	12	2	4
3	4	12	0	3
2	5	10	−2	2
1	6	6	−4	1
0	7	0	−6	0

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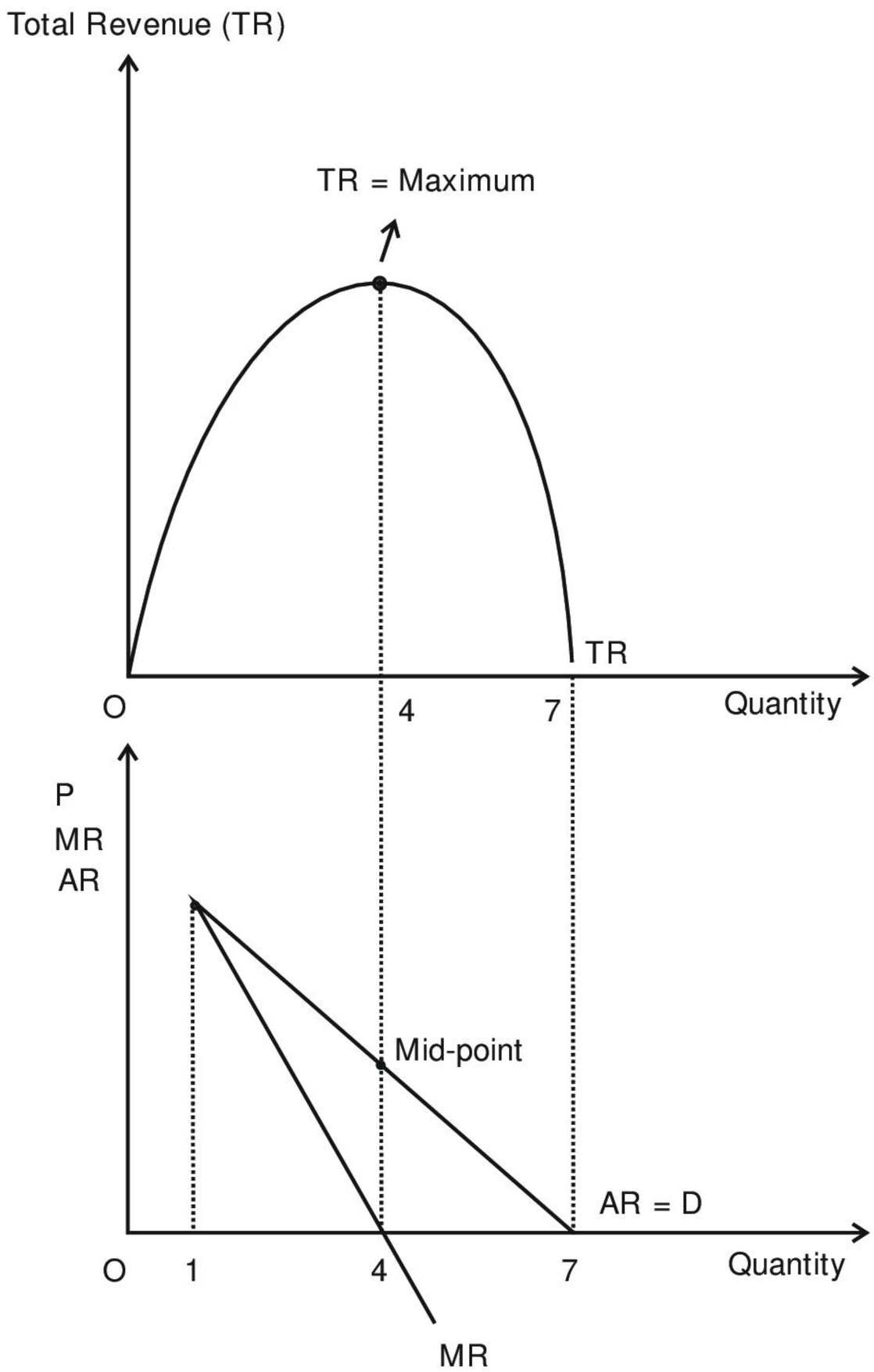

- AR = P. This will always be true because:

$$AR = \frac{TR}{Q} = \frac{P \times Q}{Q} = P$$

- Both Marginal Revenue and average revenue are downward-sloping.
- MR<AR, except for the first unit of output.
- Marginal revenue (MR) falls at a rate double that of average revenue's (AR).
- When marginal revenue is zero, average revenue will be at its mid-point and total revenue (TR) will be at its maximum.
- Average revenue intersects the x-axis at twice the quantity for which marginal revenue intersected the x-axis.
- The average revenue curve is also the demand curve.

Relationship between MR and TR

- As long as, MR > 0, TR rises
- When, MR = 0, TR is at its maximum
- When, MR < 0, TR falls.

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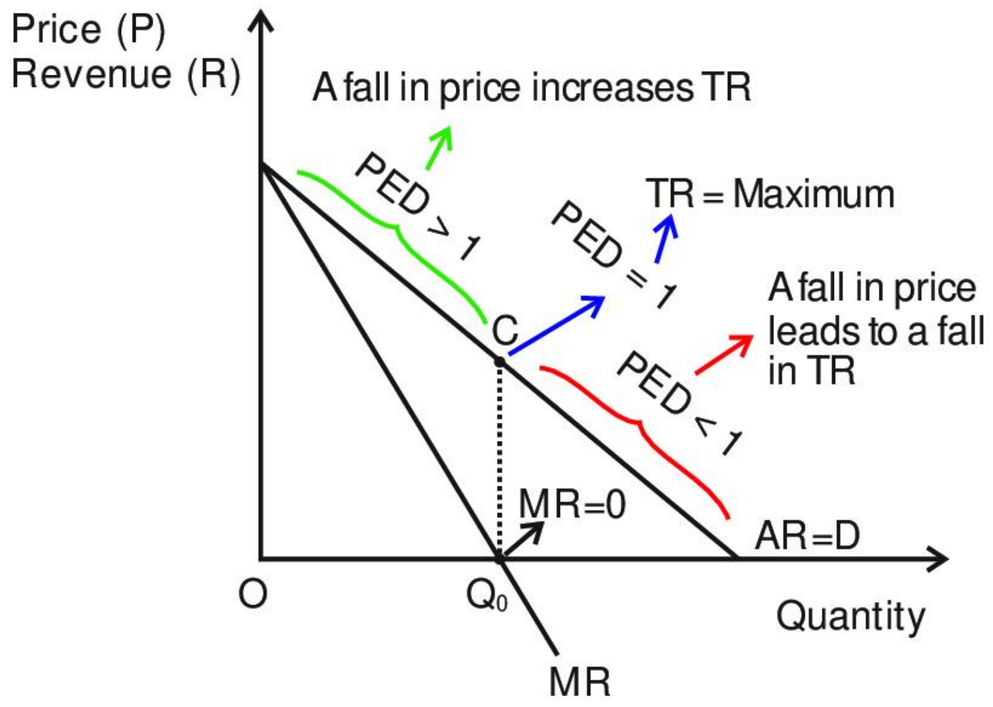
Relationship between MR, AR, and elasticity of demand

- MR = Positive ⇒ AR = D ⇒ Elastic ⇒ P↓ ⇒Q↑↑ ⇒ TR↑
- MR = Zero ⇒ AR = D ⇒ Unitary Elastic ⇒ TR = Maximum
- MR = Negative ⇒ AR = D ⇒ Inelastic ⇒ P↓↓ ⇒ Q↑ ⇒ TR↓



According to PED, we know that:

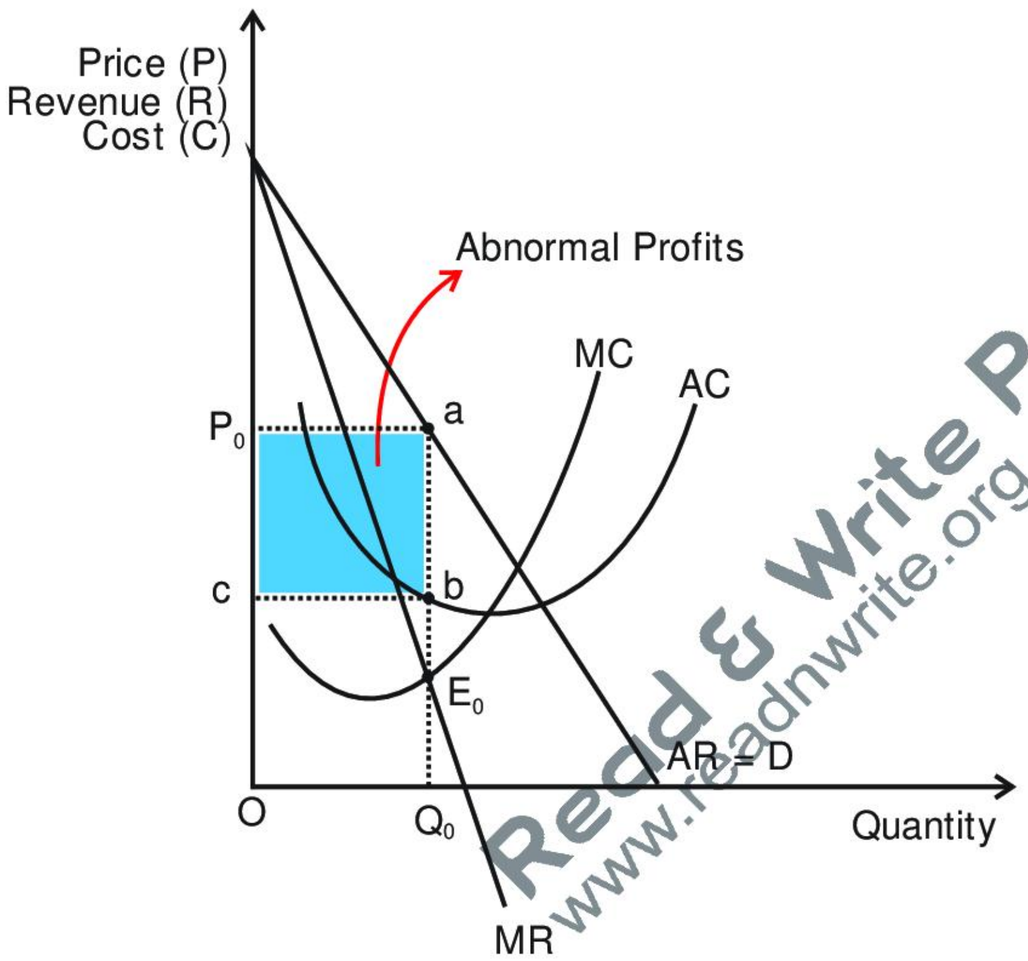
$$PED = \frac{\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$$

$\frac{\Delta Q}{\Delta P}$ will remain unchanged as we move along the demand curve. However, it is $\frac{P_1}{Q_1}$ that will change and determine the value of PED. As we move along the AR (demand) curve, the numerator (P_1) falls, and the denominator (Q_1) rises. Before the mid-point (point C) of the demand curve, PED will be greater than one. At the mid-point, when MR = 0, PED will be equal to one. Beyond the mid-point, PED will be lesser than one.

Price and Output Determination in Short Run

Types of profits:

a) Supernormal Profit



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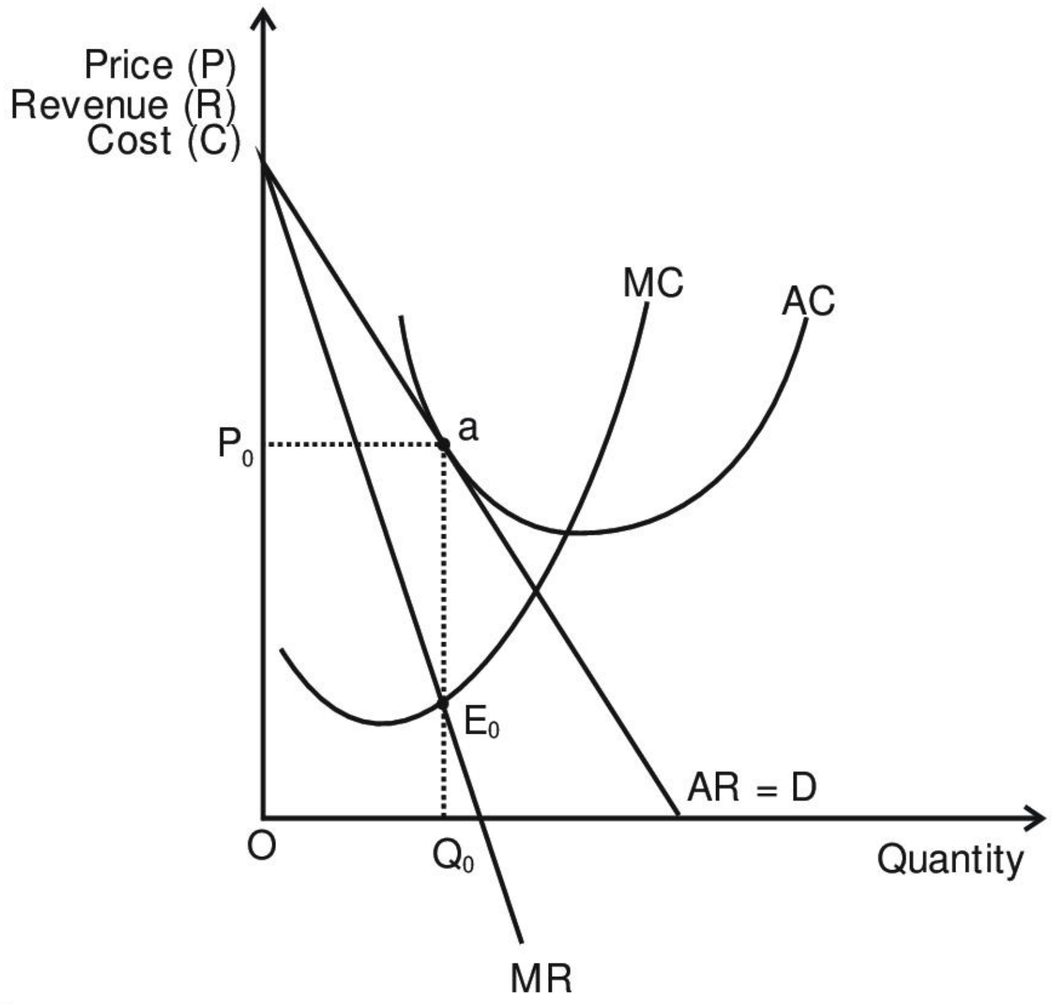
According to the above diagram:
- The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
- At profit-maximizing output Q_0:
  $AR = aQ_0 = 0P_0$
  $AC = bQ_0 = 0c$

Since, at this point, AR > AC, the firm is earning abnormal profits.
- Average Abnormal Profits = $AR - AC = aQ_0 - bQ_0 = ab$
- Quantity = $0Q_0 = bc = P_0a$
- Total Abnormal Profits = Average Abnormal profit × Quantity = $bc \times P_0a = P_0abc$

Alternatively:
- Total Revenue = $AR \times Q = aQ_0 \times 0Q_0 = 0P_0aQ_0$
- Total Cost = $AC \times Q = bQ_0 \times 0Q_0 = 0cbQ_0$
- Total Abnormal Profit = $TR - TC = 0P_0aQ_0 - 0cbQ_0 = P_0abc$

b) Normal Profit



According to the above diagram:
- The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
- At profit-maximizing output Q_0:
  $AR = aQ_0$
  $AC = aQ_0$
- Since, at this point, AR = AC, the firm is earning normal profits.

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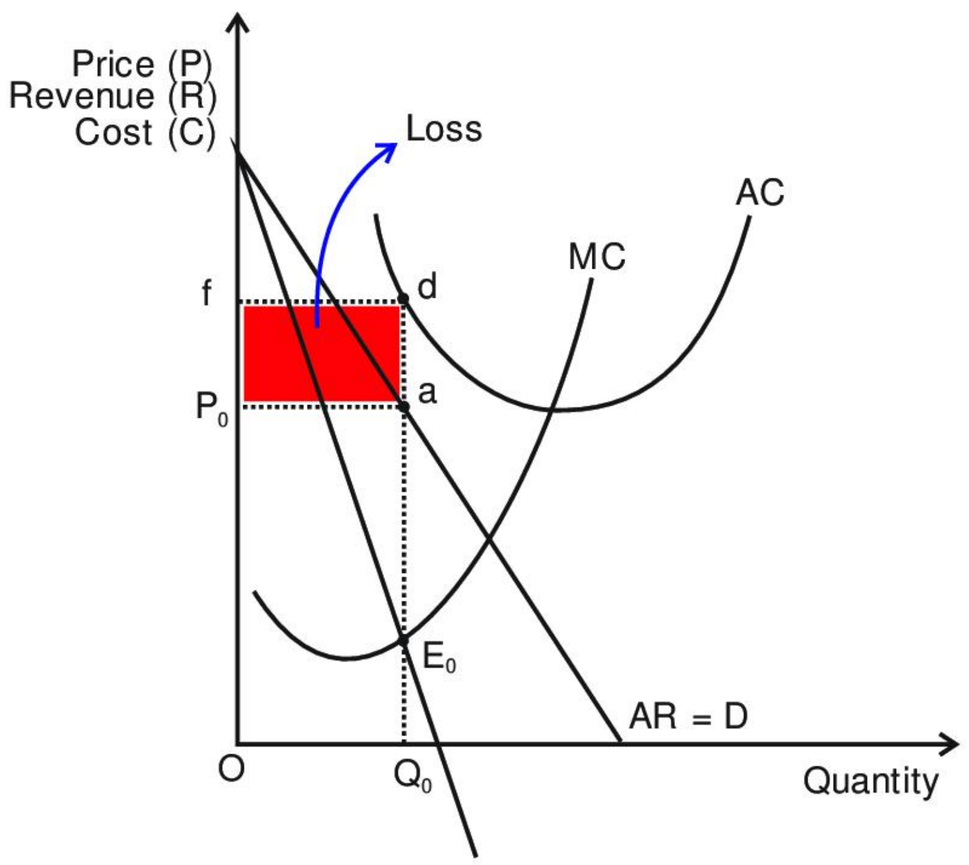
c) Loss



According to above diagram:

- The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
- At loss-minimizing output Q_0:

  $AR = aQ_0 = 0P_0$

  $AC = dQ_0 = 0f$

Since, at this point, AR = AC, the firm is incurring subnormal profits or losses.

$\text{Average Loss} = AC - AR = dQ_0 - aQ_0 = ad$

$\text{Quantity} = 0Q_0 = P_0a = fd$

$\text{Total Loss} = \text{Average Loss} \times \text{Quantity} = ad \times P_0a = P_0adf$

Alternatively:

$\text{Total Revenue} = AR \times Q = aQ_0 \times 0Q_0 = 0P_0aQ_0$

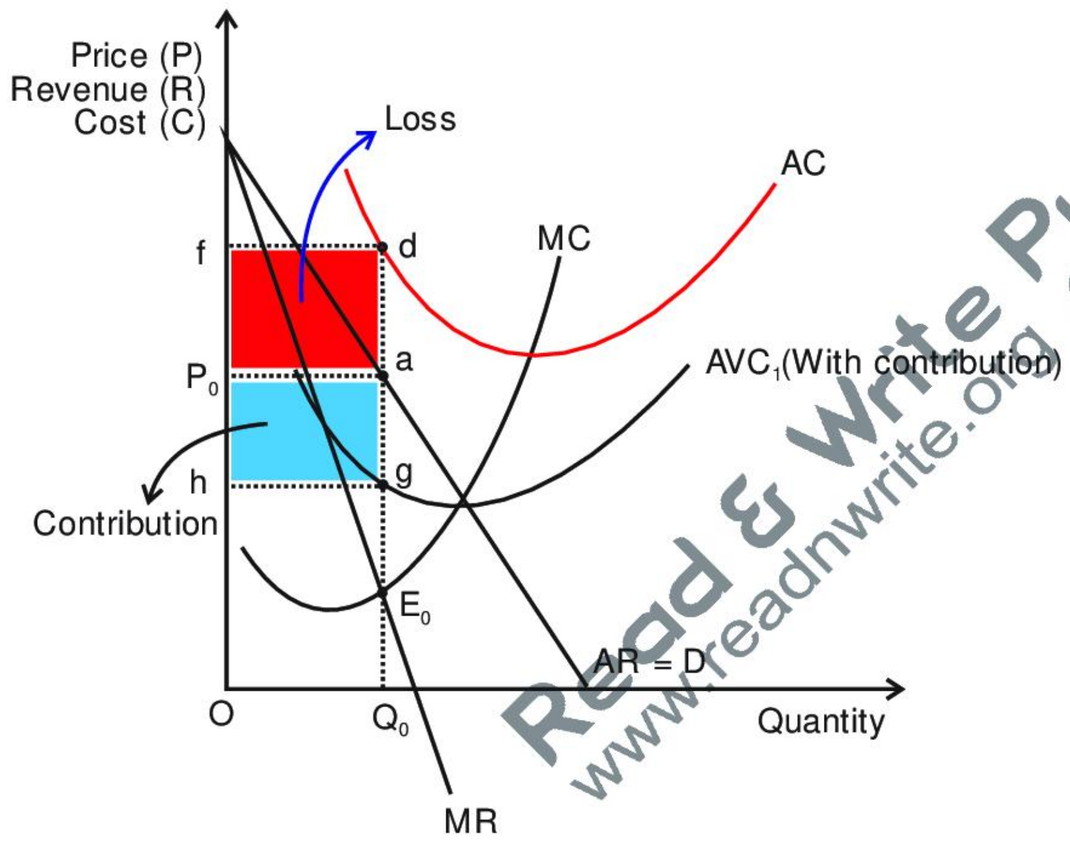
$\text{Total Cost} = AC \times Q = dQ_0 \times 0Q_0 = 0fdQ_0$

$\text{Total Loss} = TC - TR = 0P_0aQ_0 - 0fdQ_0 = P_0adf$

Types of losses

There are three types of losses based on whether the firm does or does not cover its variable cost.

a) Loss with contribution



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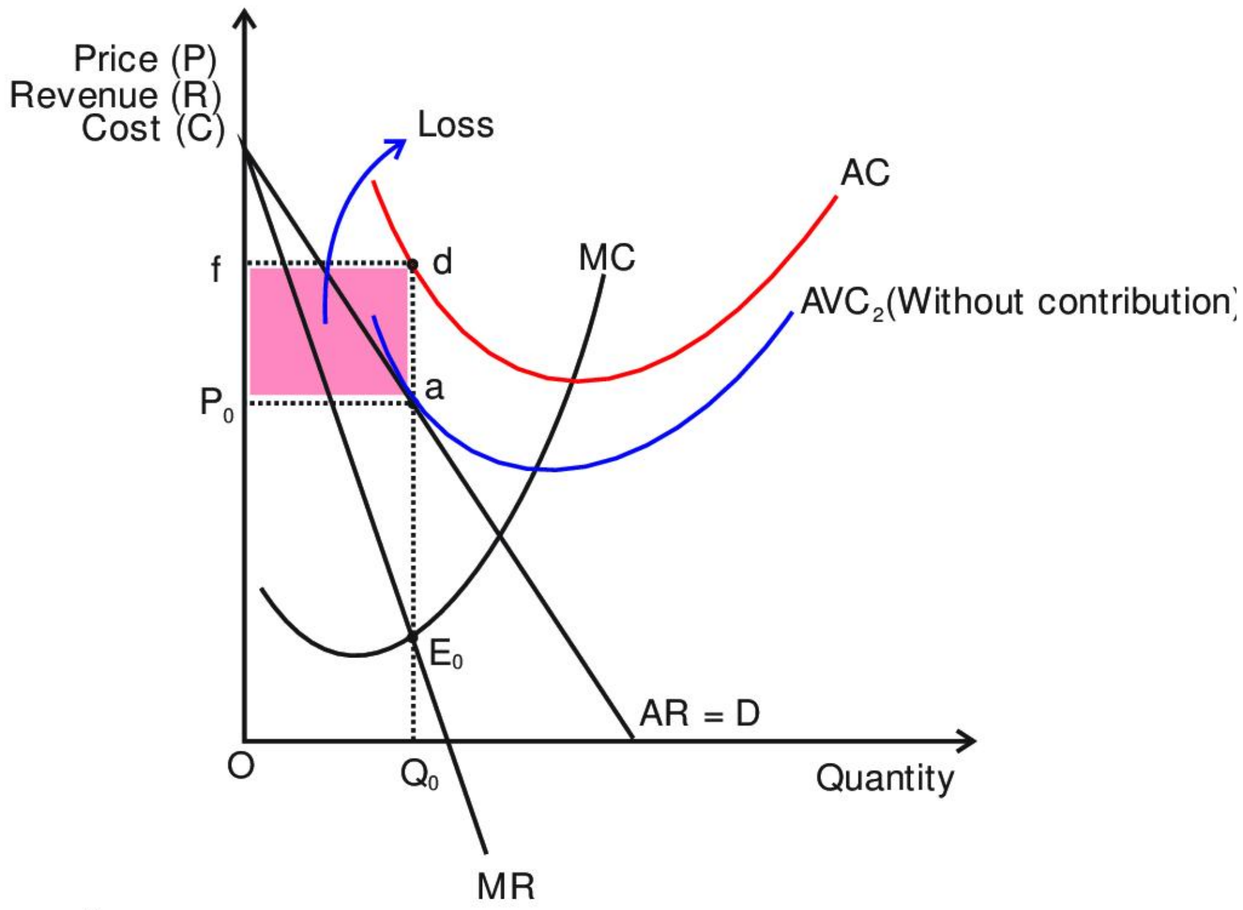
According to the above diagram,

- The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
- The average variable cost (AVC_1) for Q_0 is g, and the average cost (AC) is d.
- The difference between the AC curve and AR=D curve at a certain point represents loss per unit.
- The difference between the AC curve and AVC_1 curve at a certain point represents fixed costs per unit.
- The difference between the AR=D curve and AVC_1curve at a certain point represents contribution per unit.
- For Q_0: the contribution per unit is equal to P_0h=ag, and the quantity being produced is Q_0. Multiplying these yields the rectangular area P_0agh, and this represents total contribution towards fixed costs. The firm is able to cover its variable costs, and also contribute towards covering some of its fixed costs.
- For Q_0: the loss per unit is equal to da, and this multiplied by the quantity Q_0 is the area fdaP_0, which represents the total loss.

b) Loss without contribution (zero contribution)



According to the above diagram,

- The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
- The average variable cost (AVC_2) for Q_0 is a, and the average cost (AC) is d.
- The difference between the AC curve and AR=D curve at a certain point represents loss per unit.
- The difference between the AC curve and AVC_2 curve at a certain point represents fixed costs per unit.
- The difference between the AR=D curve and AVC_2 curve at a certain point represents contribution per unit.
- For Q_0: the contribution per unit is zero, since there is absolutely no difference between AR and AVC_2—both are 'a'. The firm is exactly able to cover its variable costs, but not contribute anything towards fixed costs.
- For Q_0: the loss per unit is equal to da, and this multiplied by the quantity Q_0 is the area fdaP_0, which represents the total loss.

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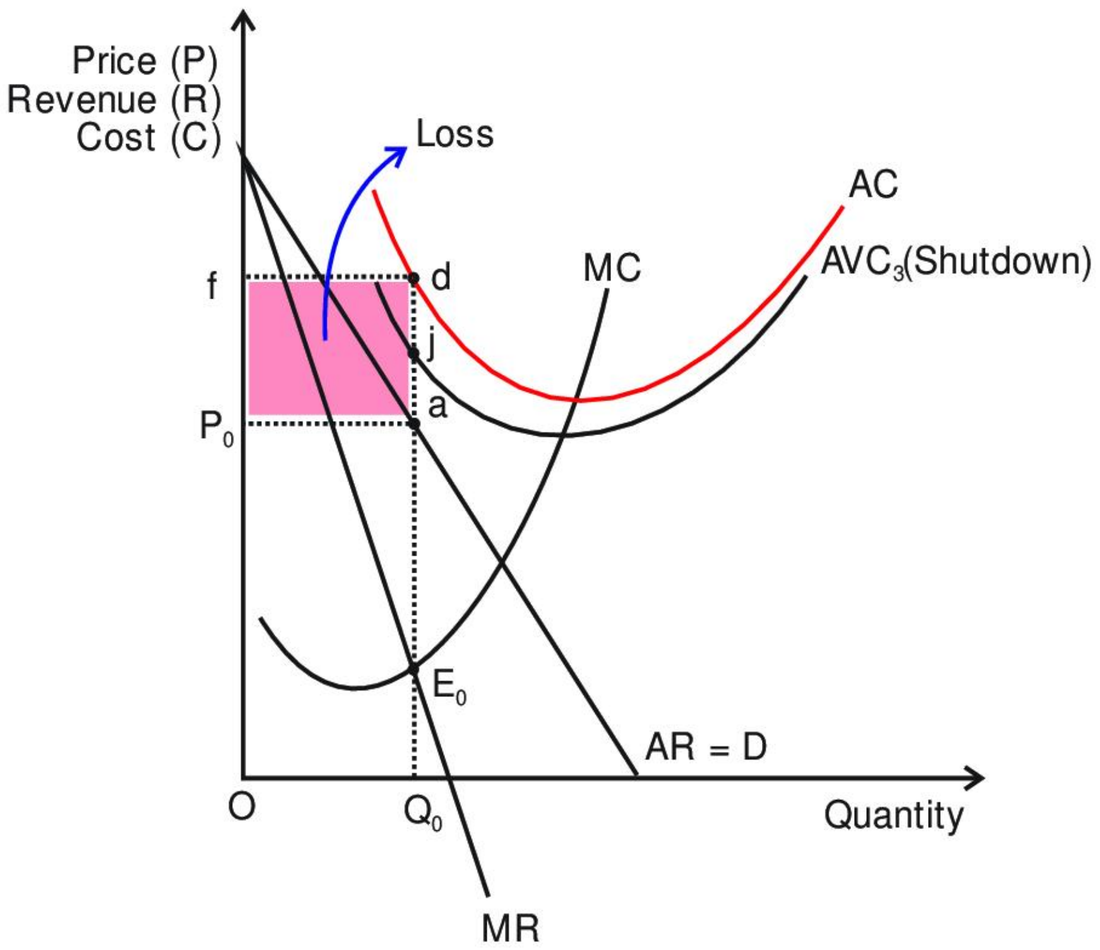
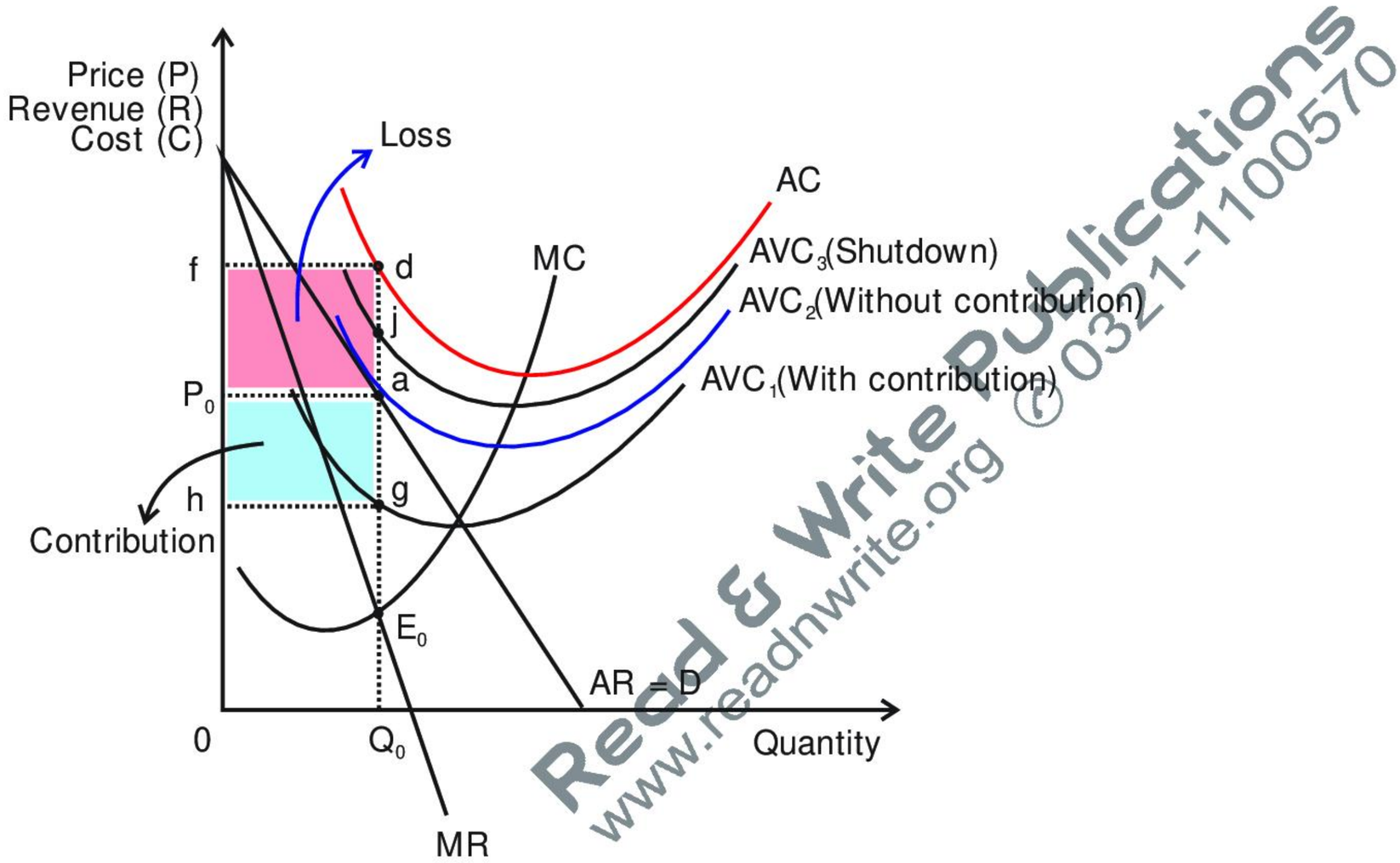
c) Shutdown



According to the above diagram,

- The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
- The average variable cost (AVC_3) for Q_0 is j, and the average cost (AC) is d.
- The average revenue (AR) being earned is a.
- The difference between the AC curve and AR=D curve at a certain point represents loss per unit.
- The difference between the AC curve and AVC_2 curve at a certain point represents fixed costs per unit.
- For Q_0: the loss per unit is equal to da, and this multiplied by the quantity Q_0 is the area $fdaP_0$, which represents the total loss. The firm should shut down in the short run, because it cannot operate without at the very least paying off its variable costs.

Summary



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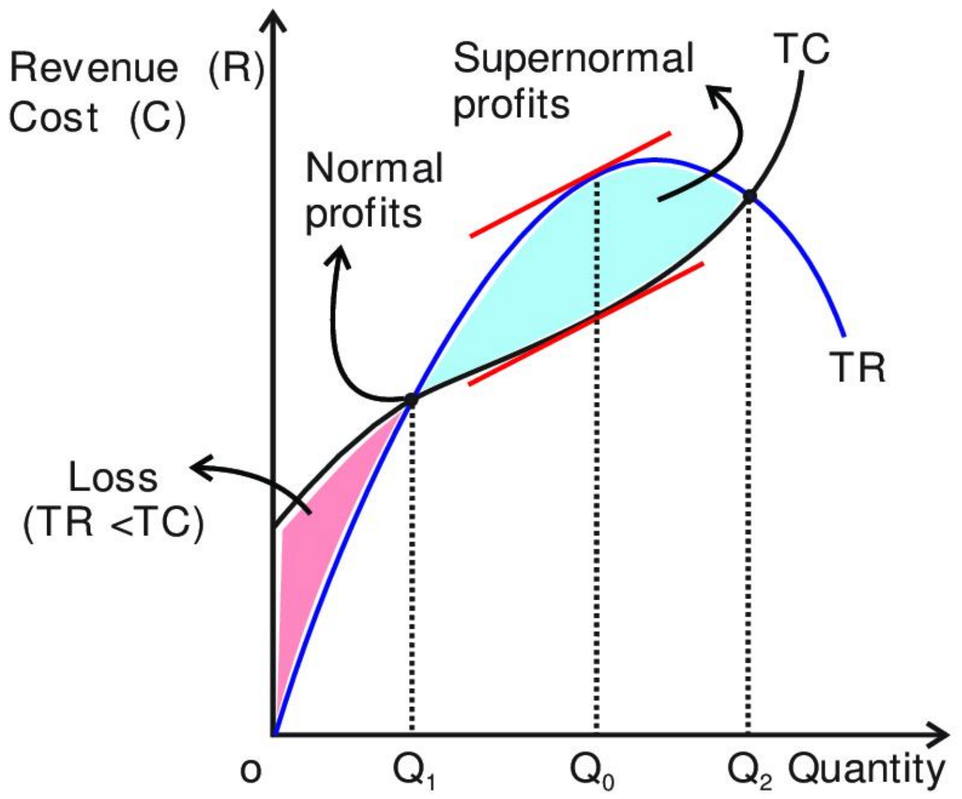
According to the above diagram,
- The profit-maximizing point is where MC = MR, at point E_0, with market price P_0 and output Q_0.
- With average cost curve AVC_1, the total contribution is equal to P_0agh and total loss is $fdaP_0$.
- With average cost curve AVC_2, the total loss is $fdaP_0$.
- With average cost curve AVC_3, the total loss is $fdaP_0$, but the firm should shut down in the short run.

Short-run equilibrium of Monopoly using TC and TR curves

Profit maximizing point where tangent to TC becomes parallel or where there is maximum distance between TR and TC.



According to the above diagram,
- The profit-maximizing point is where MC = MR. It is important to note that MR is the gradient of the TR curve and MC is the gradient of the TC curve. Therefore, the quantity at which the gradients of TR and TC are equal, is the same point at which MC=MR, thereby establishing the profit-maximizing quantity Q_0.
- For any quantity below Q_1, TR<TC, so it represents a loss.
- For any quantity between Q_1 & Q_2, TR>TC, so it represents abnormal profits
- For quantity Q1 or Q2, TR = TC, so it represents normal profits.

Price and Output Determination in Long Run

A monopoly is able to keep potential rivals out of the market through natural and artificial barriers to entry. Therefore, a monopolist is able to earn the same economic profits in the long run that it was earning in the short run. These profits may be categorized as:
i. Supernormal
ii. Normal
iii. Subnormal

Depending on the costs it incurs and the price it can charge for a product.

Barriers to Entry

1. Natural Monopoly

A natural monopoly is formed in a situation where economies of scale are so significant that costs are only minimized when the entire output of an industry is supplied by a single producer, and the industry may not be able to support more than one producer operating at its minimum-efficient scale.
The railway, electricity transmission, and general post office are good examples of natural monopolies. Usually, natural monopolies are operated under state control to achieve social and political objectives and an economic justification of very high economies of scale. In this case, new firms find it impossible to enter the industry.

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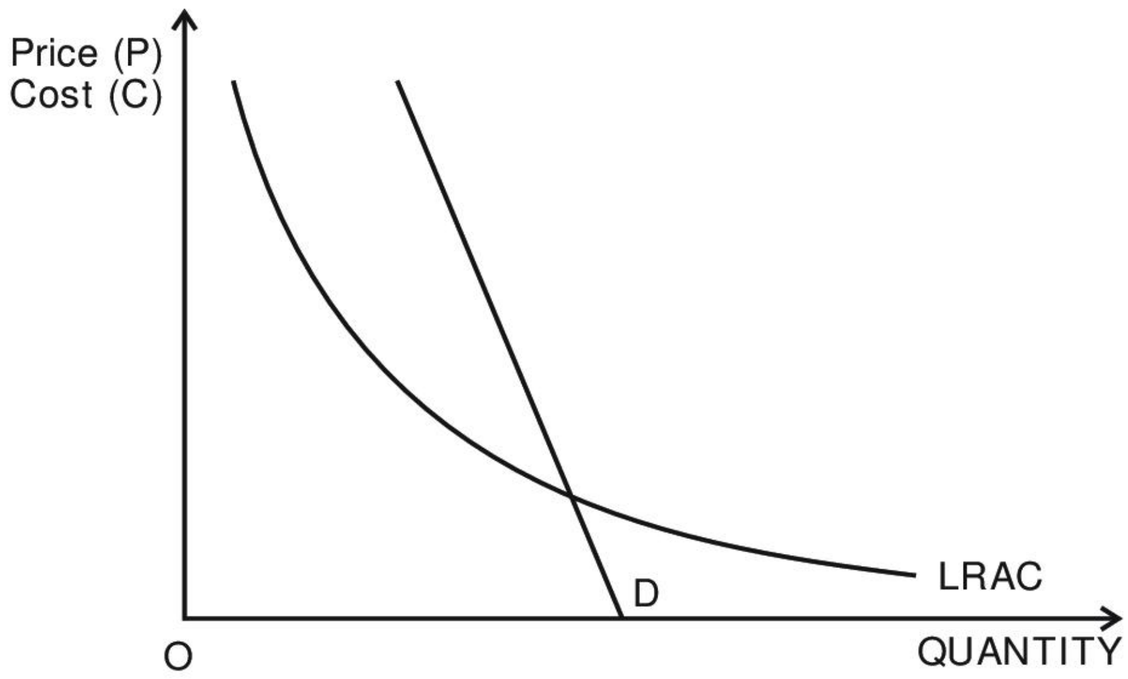
If natural monopolies operate under the private sector, the cost-advantages for the monopoly will still be a powerful barrier to entry for other firms.
A natural monopoly's diagram shows a market demand unable to cover its MES (minimum efficient scale).



2. High set-up Costs

Some industries have very high set-up costs. Examples of such industries include electricity generation, airline services, car production, and pharmaceuticals. Only firms with high capital and the ability to bear losses over a long period of time would be able to enter these industries. The high set-up costs, therefore, function as a barrier to entry.

3. High Sunk Costs

Sunk costs are those expenditures on factor inputs which cannot be covered in case the firm shuts down. This is because some resources like plant and machinery are very specialized and they are not easily transferable to other uses or cannot be resold easily.
High sunk costs increase the risk for new entering firms—the prospect of losing an extremely costly investment and not being able to recover it keeps potential entrants away.

4. Predatory/ Destroyer Pricing

Predatory pricing is a pricing policy by a firm(s) in which the existing firm cuts it prices to drive competitors out of the market. Due to large economies of scale, existing firms will benefit from a lower AC than those which are just starting up. This allows them to set predatory prices which are lower than the market price, in order to harm or even eliminate any new entrants into the industry.

5. Brand Proliferation and Brand Loyalty

Brand proliferation is an act of producing a number of brands of a particular product giving an apparent abundance of choices to consumers so that market niches are closed; e.g., proctor and gamble is producing shampoos under different brand names such as Head and shoulders, Pert Plus, Panteen, etc. Existing firms can make entry more difficult by brand proliferation.
Brand loyalty refers to the continuing willingness of consumers to highly prefer one firm's products over its competitors'. Through advertising and promotional activities, existing firms can increase brand loyalty in order to restrict potential entries of new firms.

Other ways which restrict new firms from entering the market are:

- Control over supplies of raw materials
- Control over retail outlets
- Legal protection, e.g., patents and copyrights
- Mergers and take-overs
- Aggressive tactics, e.g., price wars, massive advertising, and after-sales services, etc.
- Pace of innovation, e.g., computers and electronics
- Market condition; for example, a recession limits the profitability and incentives for new entrants.

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UNIT 6

Monopolistic Competition

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Features

- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:

- total, average and marginal revenue

c. Short-run price and output determination

- normal, abnormal and subnormal profits
- types of losses and shutdown in short-run

d. Long-run price and output determination:

- abnormal to normal profits
- losses to normal profits

Unit 6 Monopolistic Competition

Monopoly and perfect competition are two extremes, and many industries fall in between. There are very few pure monopolies, since there are very few commodities for which close substitutes do not exist. Similarly, there are very few commodities that are entirely homogenous to make the assumption of perfect competition realistic. There is, thus, a large grey area between these two extremes. Monopolistic competition is one of the market structures that lie within this grey area.

Features:

1. Relatively large number of sellers

Monopolistic competition is characterized by a fairly large number of firms, say, 25, 30, 60, or 70, not by the hundreds or thousands of the firms in pure competition.

2. Small market shares

Each firm has a comparatively small percentage of the total market and, consequently, has limited control over market price.

3. No collusion

The presence of a relatively large number of firms ensures that collusion by groups of firms to restrict output and set prices is unlikely.

4. Independent action

With numerous firms in an industry, there is no feeling of interdependence among them; each firm can determine its own pricing policy without considering the possible reactions of rival firms. A single firm may benefit from a modest increase in its sales by cutting price, but the effect of that action on competitors' sales will be nearly imperceptible and probably trigger no response.

5. Products

In contrast to pure competition, in which there is a standardized product, monopolistic competition is distinguished by product differentiation. Monopolistically competitive firms turn out variations of a particular product. They produce products with slightly different physical characteristics, offer varying degrees of customer service, provide varying convenience regarding location, or proclaim special qualities, either real or imagined, for their products. However, in some cases, monopolistic competition may also have homogeneous products.

6. Some control over price

Despite the relatively large number of firms, monopolistic competitors do have some control over their product prices because of product differentiation. If consumers prefer the products of specific sellers, then,keeping within limits, they will pay more to satisfy their preferences. Sellers and buyers are not linked randomly, as in a perfectly competitive market. But the monopolistic competitor's control over price is quite limited, since there are numerous potential substitutes for its product.

7. Easy entry and exit

Entry into monopolistically competitive industries is relatively easy compared to oligopoly or pure monopoly. Because monopolistic competitors are typically small firms, both absolutely and relatively, economies of scale and capital requirements are both low. On the other hand, compared with perfect competition, financial barriers may result from the need to develop and advertise a product that differs from rival products. Some firms may hold patents on their products or copyrights on their brand names, making it difficult and costly for other firms to imitate them.
Exit from monopolistic competitive industries is still easier. Nothing prevents an unprofitable monopolistic competitor from going out of business and shutting down.

8. Advertising

The expense and effort involved in product differentiation would be wasted if consumers were not aware of product differences. Thus, monopolistic competitors advertise their products, often heavily. The goal of

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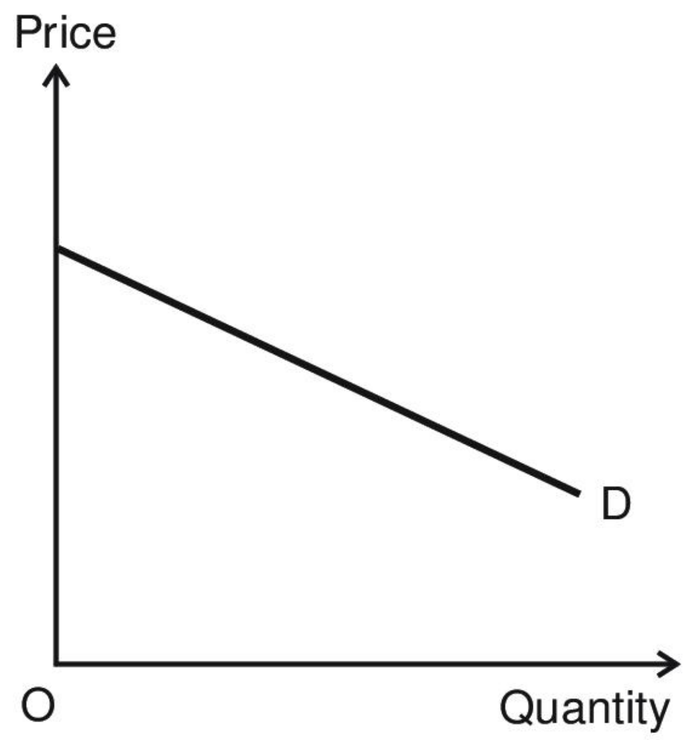
product differentiation and advertising—so called non price competition—is toemphasize product differences. If successful, the firm's demand curve will shift to the right and become less elastic.

9. The firms demand curve

Our explanation is based on the figure below.



The basic feature of this diagram is elasticity of demand, as shown by the individual firm's demand curve. The demand curve faced by a monopolistically competitive seller is highly, but not perfectly, elastic. It is precisely this feature that distinguishes monopolistic competition from perfect competition. The monopolistic competitor's demand is more elastic than that for a pure monopolist, because the monopolistically competitive seller has many competitors producing closely substitutable goods. The pure monopolist has no rivals at all. Yet, for two reasons, the monopolistic competitor's demand is not perfectly elastic like that of the pure competitor. Firstly, the monopolistic competitor has few rivals; and secondly, its products are differentiated, so they are not perfect substitutes.

The price elasticity of demand faced by a firm in monopolistic competition depends on the number of rivals and the degree of product differentiation. The larger the number of rivals and the weaker the product differentiation, the greater the price elasticity of each seller's demand—that is, the closer monopolistic competition will be to perfect competition.

Examples

Manufactured ice, plastic pipe, book publishing, paper board boxes, textile machinery, leather goods, lighting fixtures, wood furniture, wooden kitchen cabinets, petrol stations, soap, textile bags, bolts and nuts, jewelry, sawmills, women dresses, sheet metal work, wood pallets, fast food restaurants, hairdressers and perfumes, etc.

10. Imperfect knowledge

Unlike perfect competition, buyers do not have perfect knowledge in monopolistic competition.

11. Non-price competition

Firms in monopolistic competition exercise non-price competition through advertising and other promotional activities, which were missing in perfect competition.

12. Profits

Firms in monopolistic competition may earn normal, supernormal, or sub-normal profits in the short-run, but in the long-run normal profits prevail, because of the freedom of entry and exit.

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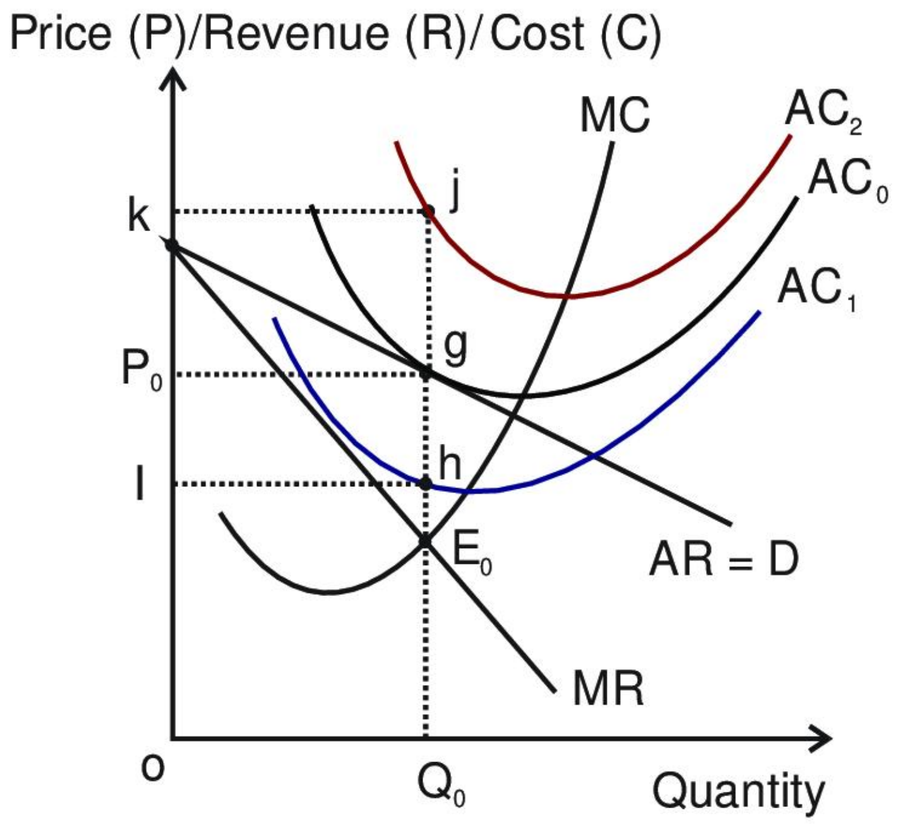
Price and Output Determination in Short Run

As with other market structures, profits are maximized at the output where MC = MR. The diagram for a firm in monopolistic competition will be the same as for the monopolist, except that the AR and MR curves will be more elastic. This is illustrated in the diagram below. As with perfect competition, it is possible for a firm in monopolistic competition to make supernormal profits in the short run. This is shown as P_0ghi area in the figure as follows:



Similarly, a firm in monopolistic competition can earn normal profits as shown in the figure above and losses (subnormal profits), as shown in the figure above. The shaded area in the figure shows the amount of economic losses a firm can face in the short run.

Just how much profit the firm can make in the short run depends on the strength of demand, i.e., the position and elasticity of the demand curve. The further to the right the demand curve is from the average cost curve, the less elastic the demand curve is, the greater the firm's short-run profit. Thus, a firm whose product is considerably differentiated from its rivals may be able to earn considerable short-run profits.

Price and Output Determination in Long Run

Assuming the operation of the entry and exit of firms in a monopolistic competition is the same as that for pure competition, the adjustment process will ultimately lead to the existence of only normal profits. This is a realistic assumption for, in the long run, no firm can earn either supernormal profits or incur losses, since each produces a similar product.

If firms in the monopolistic competitive industry are earning supernormal profits, new firms will be attracted into the group. With the entry of new firms, the existing market is divided among more sellers so that each firm will sell fewer quantities of the product than before. As a result, the demand curve for individual firms will shift down and to the left, becoming more elastic (flatter) because of the development of new close substitutes.

At the same time, the entry of new firms will increase demand and, hence, the price of factor inputs will rise, causing the cost curves of the firms to shift upwards. This combination of lower demand and higher costs will reduce supernormal profits. Thus, each firm will be earning normal profits in the long run. This situation is illustrated in the figures below.

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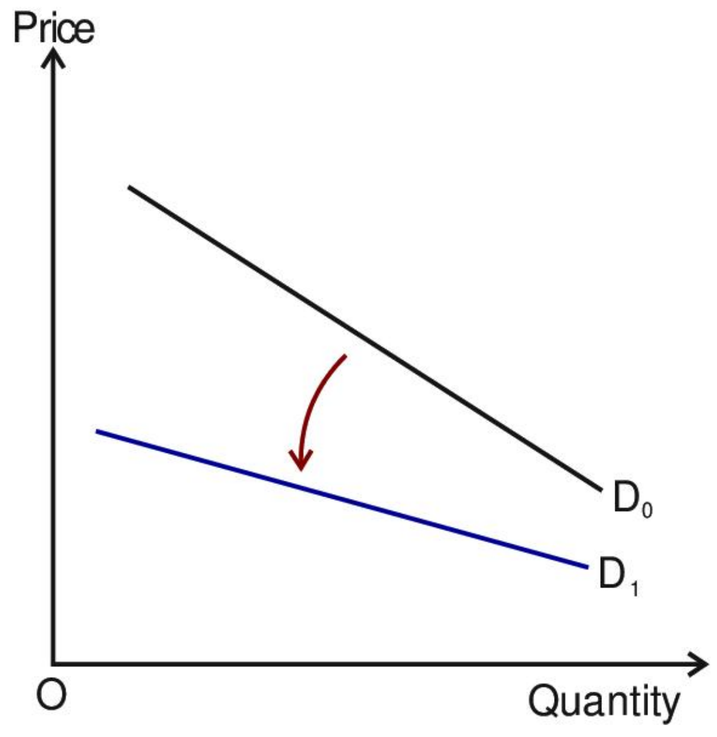
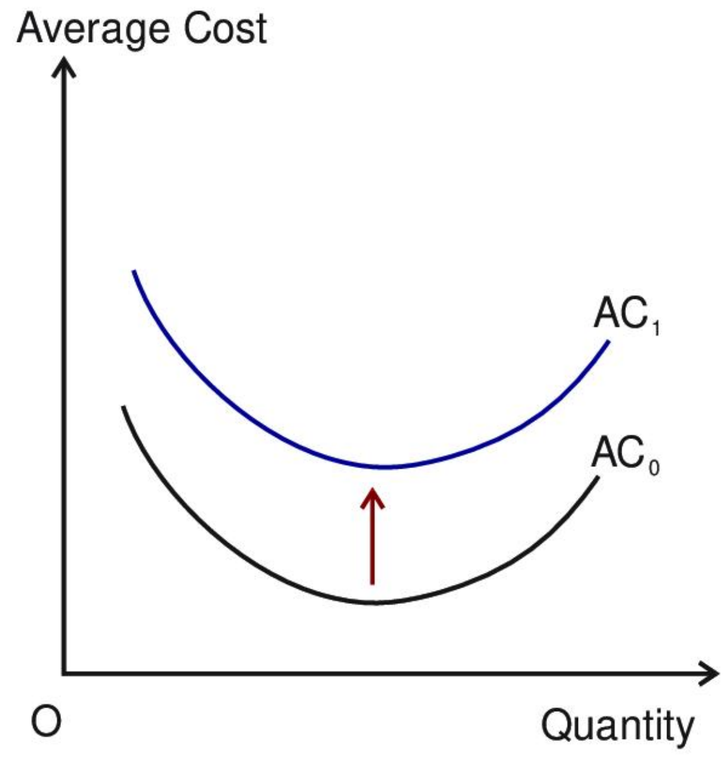
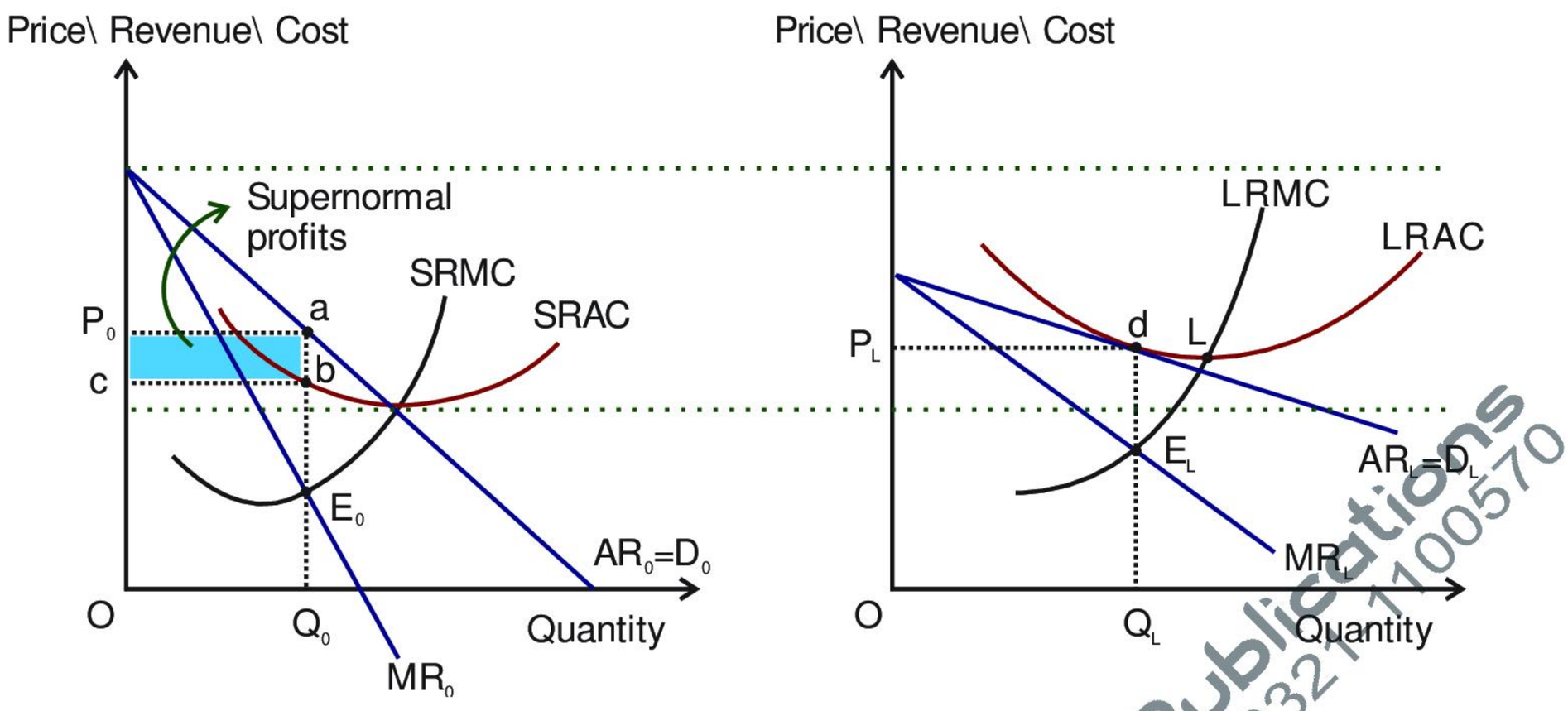




– Entry of new firms causes fall in demand of individual firm and makes it elastic (flatter), i.e., from D_0 to D_1.
– Shift of individual firm's AC upward from AC_0 to AC_1 as more firms are now demanding scarce factor services.

Before the entry of new firms the demand and the cost conditions of the firms are represented in the figure below where it sells OQ_0 quantity of the product at (OP_0) price and earns P_0abcabnormal profits.



The left diagram illustrates the case of a firm in monopolistic competition earning supernormal profits. When new firms enter groups, the demand curve of the firm shifts downward to D_L and the long run marginal and average cost curves shift upward as LRMC and LRAC as shown in the figure above. The firm now only earns normal profits at the point of tangency (d) between the demand curve (D_L) and the long run average cost curve (LRAC). In this situation, each firm sells at a lower price (OP_L), with the result that further entry into the industry is stopped.

If firms cannot earn extra profits in monopolistic competition, they cannot incur losses either. In such a situation the losing firm will leave the industry. Supply will be reduced and price will go up. On the other hand, as firms exit the industry, resources will increase in abundance, and will become cheaper. Costs will fall. Ultimately, a rise in price and reduction in costs will eliminate losses. The final situation will be shown in the next figure, where each firm and the industry as a whole will be in long-run equilibrium.

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This long-run equilibrium analysis under monopolistic competition reveals one important fact: That each firm and the entire industry will not produce optimum output. There will always be excess capacity. This is because firms are not in a position to operate their plants at maximum capacity and enjoy economies of large-scale production fully. It is evident from the figure above, where the point of tangency between the demand curve D_L and LRAC curve is not at the lowest level, “L”. Rather, the point L is to the right of the point of tangency, “d”. This is because the demand curve D_L is not horizontal but slopes downward to the right. Thus, each firm under monopolistic competition has underutilized capacity, even in the long run

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UNIT 7

Oligopoly

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Features

- number of buyers and sellers
- nature of product
- degree of freedom of entry
- nature of information

b. Revenue:

- total, average and marginal revenue

c. Price and output determination

- non-collusive models (kinked demand curve and game theory, mutual interdependence, Prisoner's Dilemma, 2 player Pay-off Matrix)
- collusive models of price leadership and cartel

d. Growth and survival of firms

- reasons for small firms
- integration, diversification, mergers,

Unit 7 Oligopoly

Features

The following are the main features of an oligopolistic market.

1. **Few sellers:** In an oligopolistic market structure, there are only a few sellers dealing in the product.
2. **Size of firms:** Usually large.
3. **Market share:** When there are few sellers, each producer has a considerable portion of the market share and can have a noticeable effect on market conditions.
4. **Price maker:** One seller can increase or reduce the price for the whole oligopolistic market by changing the quantity it sells, affecting the profits for all other sellers.
5. **Product:** Firms in an oligopoly may produce homogenous or differentiated products. Many industrial products like steel or zinc are standardized, whereas consumer products like clothing and appliances are differentiated.
6. **Interdependence:** All firms in an oligopoly are heavily dependent upon one another. In perfect competition, monopolies, and monopolistic competition, each firm is more or less independent in the market. In perfect competition, for example, each firm plays such a minute role in the industry that any change in its price and output policy has no affect on the market at all. In the case of a monopoly producer, there is no competitor who can be influenced by its policy, since it is the only producer. In monopolistic competition, the numbers of producers are so large that no single producer can have a direct effect on other producers. However, only in an oligopoly, the actions of one producer directly affect the others.
7. **Substitutes:** In an oligopoly, firms are producing close substitutes, though they are few. The products that these firms produce have a high cross elasticity of demand with respect to each other.
8. **Rivalry:** Sometimes this interdependence leads to rivalry and price wars in an oligopolistic market. Therefore, a single move by one seller leads to counter moves by the others.
9. **Aggressive advertising:** Due to this increased interdependence firms operating in an oligopoly heavily invest in advertising. They engage in this form of non-price competition.
10. **Barriers to entry:** In order to protect the profits being earned by existing firms, oligopolies have high barriers to entry, preventing new firms from entering the market. These barriers take different forms, such as high setup costs. New firms entering the market do not have large capital to invest in new plants and machinery. New firms also do not have an established reputation in the market, so they try to practice brand loyalty to increase their number of customers. They also have legal protection through patents and copyrights.
11. **Mergers:** A key feature of firms in an oligopoly is mergers. Two or more competitive firms may merge to increase their market share, and this may allow them to achieve greater economies of scale. They will also have monopoly power, resulting in greater control over the market supply and the price of the product.
12. **Knowledge:** Buyers and sellers in an oligopolistic market possess imperfect knowledge.
13. **Real-world existence:** An oligopoly is the most common market structure in the real world, as far as the production of goods is concerned. However, for the provision of services, monopolistic competition is more prevalent**.**
14. **Price collusion:** Firms in an oligopolistic market structure behave in a collusive (common price agreement) or non-collusive (no common price agreement) manner
15. **Price rigidity:.**

Price and Output Determination in Oligopoly

Because of the complex and interdependent behavior of oligopolistic firms, there is no single theory to explain their behavior. Rather, we have various models to explain the different aspects of oligopolistic market behaviour. Basically, oligopolists are pulled in two different directions:

- The interdependence of firms may make them **collude** with each other. If they can band together and act as one big monopoly, they could maximize industry profits.
- On the other hand, they will be **tempted to compete** with their rivals to gain a bigger share of the industry's profits for themselves.

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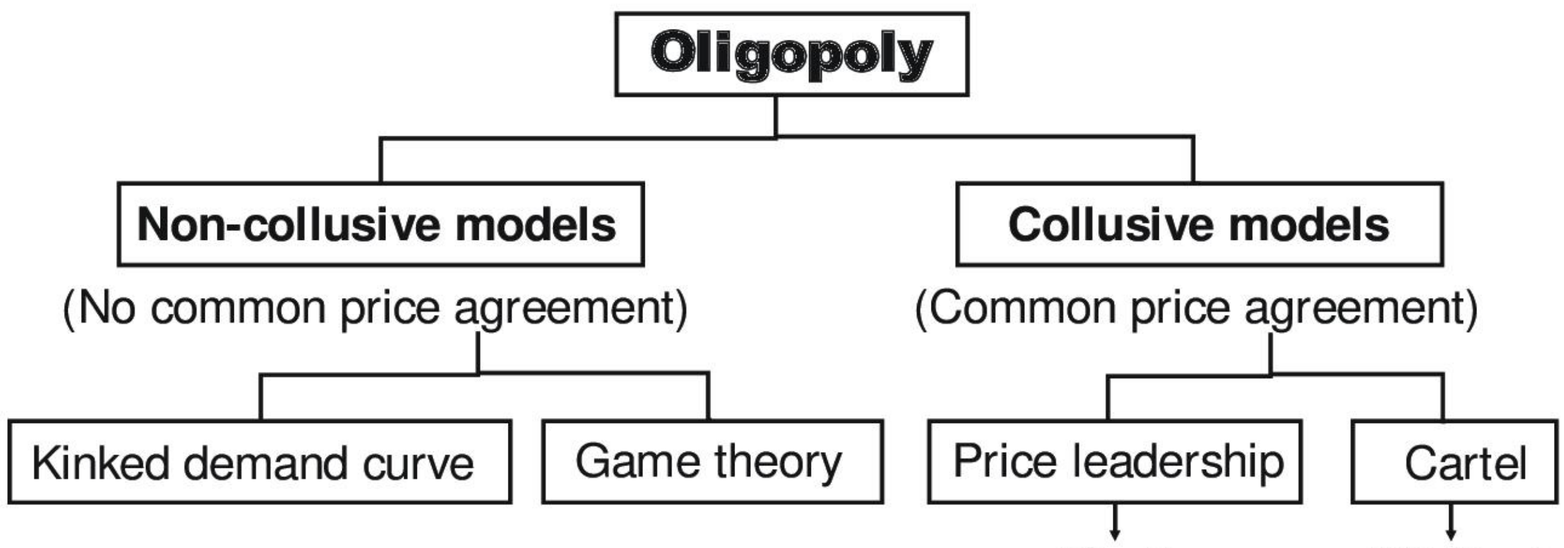
These two policies are incompatible. The more fiercely firms compete to gain a bigger share of the industry's profits, the smaller these industry profits will become—e.g., price competition will drive down the average price prevailing in the entire industry, while competition through advertising raises industry costs; either way, industry profits fall. ***Non-collusive models*** include the kinked demand curve model and game theory. ***Collusive models*** include cartel and price leadership.



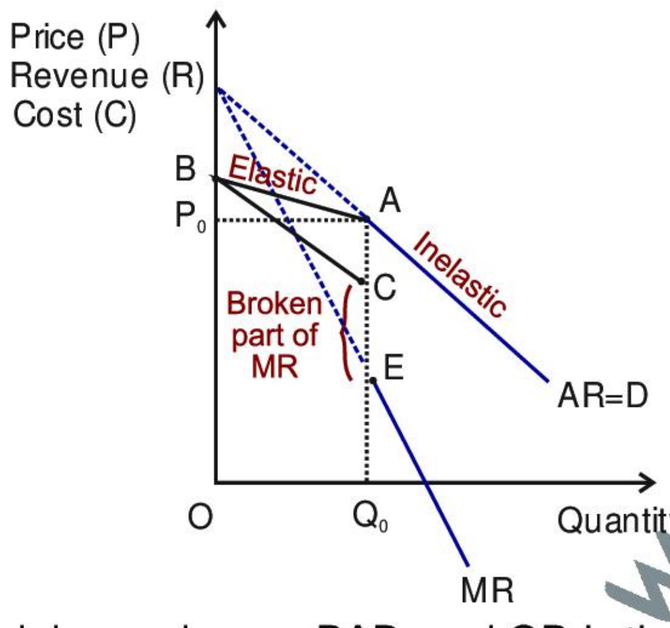
Kinked Demand Curve

Assumptions regarding the kinked demand curve

The kinked demand curve hypothesis of price rigidity is based on the following assumptions:

1. There is an established or prevailing market price for the product in the oligopolistic industry with which all sellers are satisfied.
2. If one firm raises its price, the other firms will not follow; rather, they will stick to the prevailing price and attract customers who divert away from the price-raising seller.
3. Any attempt on the part of the seller to push up his sales by reducing the price of his product will be countered by other sellers who will imitate him.

Explanation



The diagram above shows a kinked demand curve BAD, and OP_0 is the price prevailing in the oligopolistic market for quantity OQ_0 provided by one seller.

The demand curve is formed of two segments, BA and AD. If this particular firm raises the price anywhere above the prevailing price of P_0, competitors will not follow suit. Therefore, consumers will switch away from this firm's products to that of its competitors. For the elastic segment of the demand curve, BA, therefore, any changes in quantity sold will be, proportionally speaking, greater than changes in price. The part of the MR curve that corresponds to BA is BC, and for this segment it remains positive.

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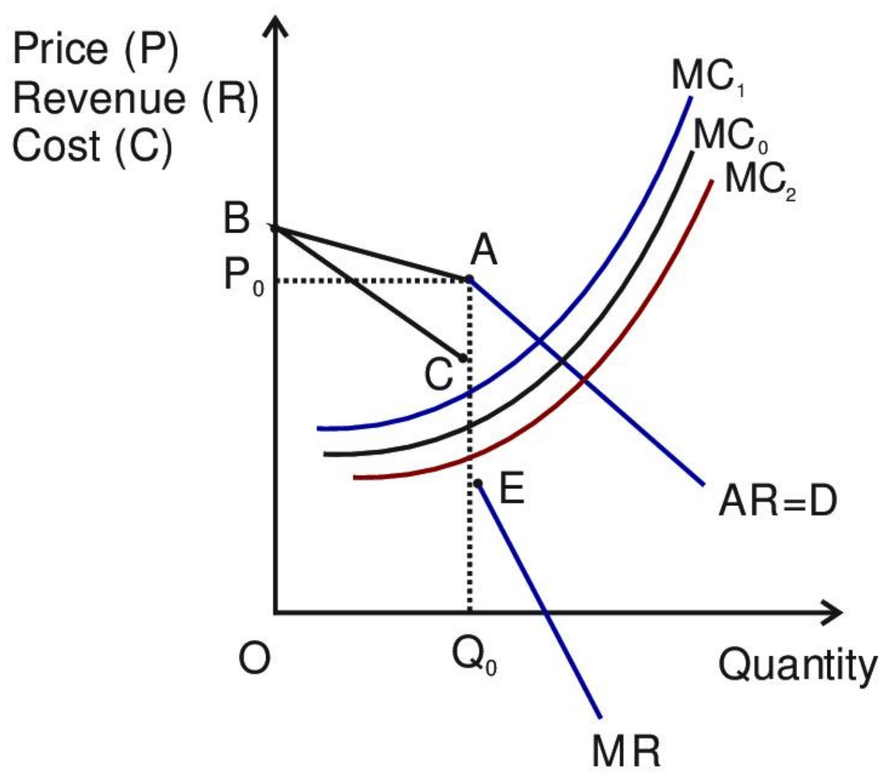
On the other hand, if the seller reduces the price of the product below OP_0, his rivals will do the same. This part of the demand curve (AD) is inelastic, because for these prices the other competitors will continue to be in direct competition. So, changes in price, proportionally speaking, will be lesser than those in quantity. As we are aware, decreases in price for an inelastic demand curve lead to an overall decrease in total revenue (as the MR curve also goes into the negative); thereby, we can conclude that although the seller's sales will increase, his profits will decrease.

The demand curve BAD is kinked exactly at point A, which causes a discontinuity in the MR curve from C to E. The size of this gap or discontinuity depends on the elasticity of the kinked demand curve. The more elastic the demand curve is to the left of point A, and the more inelastic it is to the right of point A, the larger will be the discontinuity CE. To be more precise, the more the angle BAD moves towards becoming a right angle, the greater the discontinuity CE.

Price will remain stable as long as the MC curve cuts the MR curve in the gap (CE). Thus, the oligopoly price OP_0 is determined for the product OQ_0.

Price rigidity and the kinked demand curve



According to the above diagram, for output below OQ_0,MR exceeds MC; thus, for this entire region, the more output is reduced, the more marginal profits are lost. For output beyond Q_0, MC exceeds MR, so producing anything beyond Q_0 increases marginal losses. This holds true no matter which MC curve applies, as long as the MC curve passes through the gap CE. The best decision, therefore, is to continue producing output Q_0, avoiding losing any marginal profits or incurring any marginal losses. This establishes the best combination of price and output as P_0 and Q_0. This tendency of an oligopolistic firm to price its product at P_0 is known as **price rigidity**.

However, if the MC curve crosses the broken part of MR and passes through any other point on the MR curve, it will change both the price and output of the firm.

Limitations of the kinked demand curve model

The theory of a kinked demand curve in oligopoly pricing is not without its short comings:

1. There is no explanation for how the initial predetermined price and output is achieved. For instance, as shown in the diagram of the kinked demand curve, the curve is kinked at A because OP_0 is the prevailing price. But the theory does not explain the forces that established the initial price OP_0.

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2. The kinked demand curve analysis in based on two assumptions: Firstly, other firms will follow a price cut; and, secondly, that those firms will not follow a price rise. Empirical evidence shows that during an inflationary period the rise in prices is not confined only to one firm, but is industry-wide. So all firms having similar costs will raise their prices together. In other words, there is little historical basis for a firm to believe that price increases will not be matched by rivals and that price decreases will be matched.

3. Even if we accept all assumptions of the kinked demand curve, it is unlikely that the gap in the marginal revenue curve will be wide enough for the marginal cost curve to pass through. A fall in demand or costs may even shorten it, thereby causing price to be unstable.
4. One of its major shortcomings is that the theory does not explain why prices that have once changed should settle down, again acquire stability, and gradually cause a new kink in the demand curve. Price stability may be illusory because it is not based on actual market behavior. Sales do not always occur at list prices—they are often deviations from posted prices because of trade-ins, allowances, and secret price concessions. The oligopolistic seller may outwardly keep the price stable, but he may reduce the quality or the quantity of the product.

Price rigidity

Oligopolistic prices that remain stable over a period of time are called rigid prices. Price rigidity refers to a situation when, despite changes in cost or demand conditions, the sellers do not feel inclined to change price. In the case of a majority of durable consumer goods, wholesale prices remain stable for the entire year.

Reasons of price stability

There are a number of reasons for price rigidity in certain oligopolistic markets:

1. Individual sellers in an oligopolistic industry might have learnt through experience the futility of price wars and, thus, prefer price stability.
2. They may be content with current profits and avoid any risky price changes.
3. They may also prefer to stick to the present price level to prevent new firms from entering the industry.
4. The sellers may intensify their sales-promotion efforts at the current price instead of reducing them. They may view non-price competition as being better than price rivalry.
5. After spending a lot of money on advertising his or her product, a seller may not want to raise price and risk losing potential profits. Naturally, he or she would stick to current prices.
6. If a stable price has been set through agreement or collusion, no seller would want to disturb it for fear of unleashing a price war and, thus, getting caught up in more uncertainty.
7. It is the kinked demand curve analysis which is responsible for price rigidity in oligopolistic markets.

Price Leadership

Oligopolists often try to avoid price competition or price warfare. As a result, price leadership may emerge. Price leadership is a situation in which a single firm in an industry sets the price of its product, and other firms follow the price set by the leader. Two types of price leadership have been identified: dominant price leadership and barometric price leadership.

Dominant price leadership exists when the industry consists of a single large firm that dominates the industry, and a few smaller firms. Dominant firms are able to secure compliance to their prices by smaller rivals because of their powerful position in the market. Price changes are initiated by the dominant firm, and the smaller firms simply follow the leader. A dominant firm is the one whose market share is high and whose cost of production is low (due to economies of scale). Normally, low-cost firms act as leaders.

In a situation of barometric price leadership, the industry may not be dominated by any single firm. Any firm may be the leader, or the leadership role may rotate in a rather orderly manner. Changes in demand and cost conditions in the industry may cause one firm to initiate a price change that is followed by the

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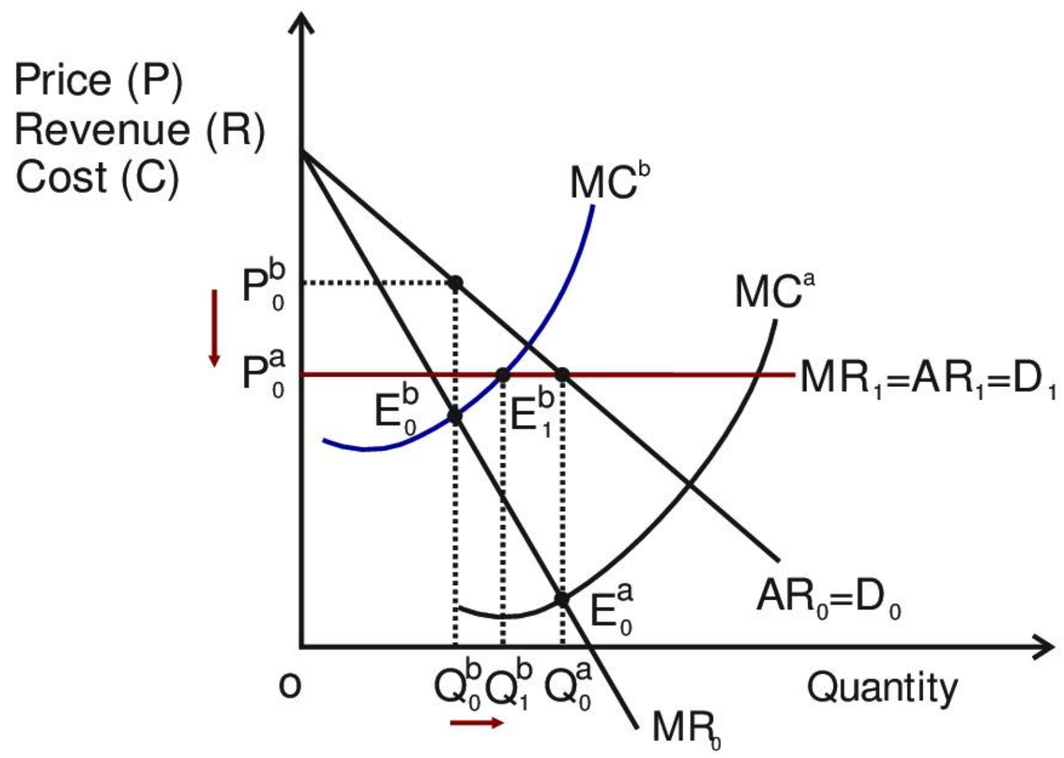
other firms in the industry. Suppliers readily accept any barometric price leader's set price because they recognize his or her adeptness at establishing prices that are reflective of changing market conditions.

Price leader-follower relationships are a typical feature of oligopolistic markets in coordinating price changes, and tend to result in a strong degree of price parallelism. Price leadership is a policy of coordinating oligopolistic price behavior, allowing firms whose fortunes are mutually independent to secure high profits. One example of price leadership is that of leadership by a dominant firm (a dominant firm price leader) possessing cost advantages over his competitors. In the diagram below, firm A is a low-cost supplier with a marginal cost curve MC^a; firm B has higher costs with a marginal cost curve MC^b. The individual demand curve of each firm is D_0 when they set identical prices (that is, it is assumed that total industry sales at each price are divided equally between the two firms); MR_0 is the associated marginal revenue curve. Firm A is able to maximize his profits by producing output Q_0^a (where $MC^a = MR_0$) at a price of P_0^a. Firm B would like to charge a higher price (P_0^b), but the best it can do is to 'accept' the price set by firm A, although this would lead to a loss of some potential profit (i.e., it would generate an amount less than maximum profit). For firm B, any alternative price would cause a decrease in potential profit. If Firm B were to charge a higher price than OP_0^a, it would lose sales to firm A (whose price is unchanged); if it were to cut price to below OP_0^a, this would force firm A to undertake matching price cuts, causing Firm B to be stuck in a similar situation, but with a lower price, leading to a further loss in potential profits. Firm B cannot hope to win such a price war because of its higher costs. Thus, firm B's best course of action is to charge the same price as that established by firm A. Firm B will act as a price-taker now and, therefore, will face a horizontal demand and marginal or average revenue curves $MR_1=AR_1=D_1$as shown in the diagram below. The new profit-maximizing point will be established at E_1^b with output Q_1^b, as shown below.



Although price leadership may prevent a price war, in which all firms lose, the arrangement is unlikely to benefit all firms equally. A firm maximizes its profits by setting a price at which its marginal revenue equals marginal cost. Since all firms in an industry are unlikely to have the same cost, it follows that if the leader sets a price that will maximize its profits, then that single price will not benefit all firms equally. To reduce the risk of a price war, the price leader must take the situation of its followers into consideration when initiating price changes for the industry as a whole.
The above case was for a duopoly in which only two firms were operating. The same model can be extended to many firms with one dominant firm (leader) and other many small firms (followers).

Cartel:

A group of independent producers who enter into a formal agreement to control price and output in a particular industry is known as a cartel.

Most cartels are illegal domestically as they exploit consumers, but many cartels operate in international markets. The Organization of Petroleum Exporting Countries (OPEC) and the International Association of Airlines are obvious examples.

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Cartels may be perfect or imperfect. In a perfect cartel, all decisions regarding price and output are taken by a central authority, and the profits are distributed to each firm according to some rule and criteria. In practice, however, each firm has some decision-making power, and may be allowed to keep whatever profits it may earn. This type of cartel is called an imperfect cartel. However, in most cartels there is a strong temptation for each cartel member to cheat and produce more than its quota for earning more profits.

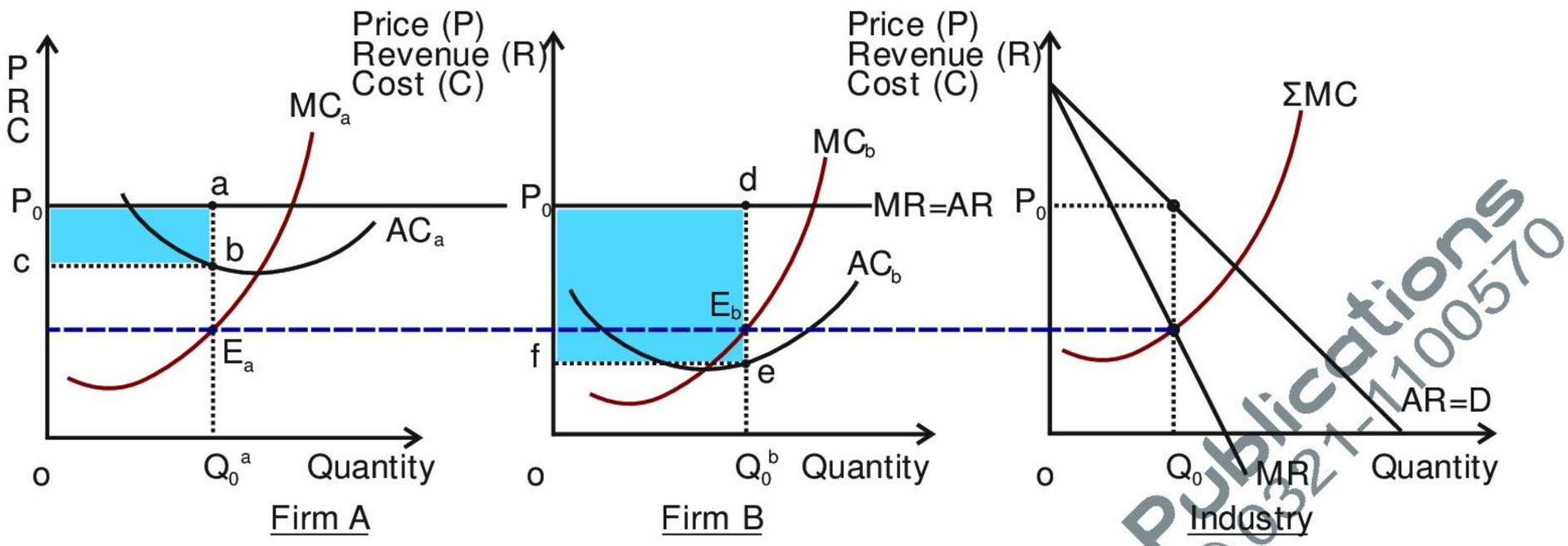
Moreover, if a new firm enters the cartel, and there is no increase in the total demand for the industry's product, the optimum output for the cartel remains unchanged, but the given profits of the group must now be shared among a greater number of members. If the new firm enters the industry but is not admitted into the cartel, then the cartel may breakdown.

Pricing and Output Policies in Cartel

If the cartel decides to maximize joint profits, it chooses a price-output combination that equates marginal revenue with marginal cost. In other words, the cartel behaves exactly like a monopolist producing its output in different plants. Cartels are usually established with the purpose of either exploiting the joint market power of suppliers to extract monopoly profits, or as a means of preventing cut-throat competition, eventually forcing firms to operate at a loss, often resorted to in times of depressed demand (a so-called '**crisis cartel**').

In the former case, a central administration agency could determine the price and output of the industry, and the output quotas of each of the separate member firms may be distributed in such a way as to restrict total industry output and maximize the joint profits of the group. Price and output will thus tend to approximate those of a profit-maximizing monopolist.

Once the cartel decides on its price-output combination, it faces the further problem of allocating output and profits among cartel members. The allocation may be done in any of several ways, including the assignment of exclusive territories and the establishment of output quotas for members. The output quota approach is followed by OPEC—perhaps the best known cartel.



We may illustrate the mechanics of an oligopolistic cartel with the help of the diagrams above. D is the industry's demand curve, showing the aggregate quantity which the combined group may sell over a range of possible prices and MR is the industry's marginal revenue curve. The industry's marginal cost curve ∑MC is constructed by joining the marginal cost curves of the individual firms making up the cartel(i.e., MC_a+ MC_b). For any given level of industry output the cartel is required to calculate the allocation of the output among the member firms on the basis of their individual marginal costs to obtain the lowest possible aggregate cost of producing "their" output.

To maximize industry profit the cartel will set price at P_0 and produce output Q_0. Quotas of Q_0^a and Q_0^b are given to firms A and B respectively, where a horizontal line drawn from the intersection of MR and ∑MC (the line of aggregate marginal costs) intersects MC_a and MC_b. The profit contributed by each firm is

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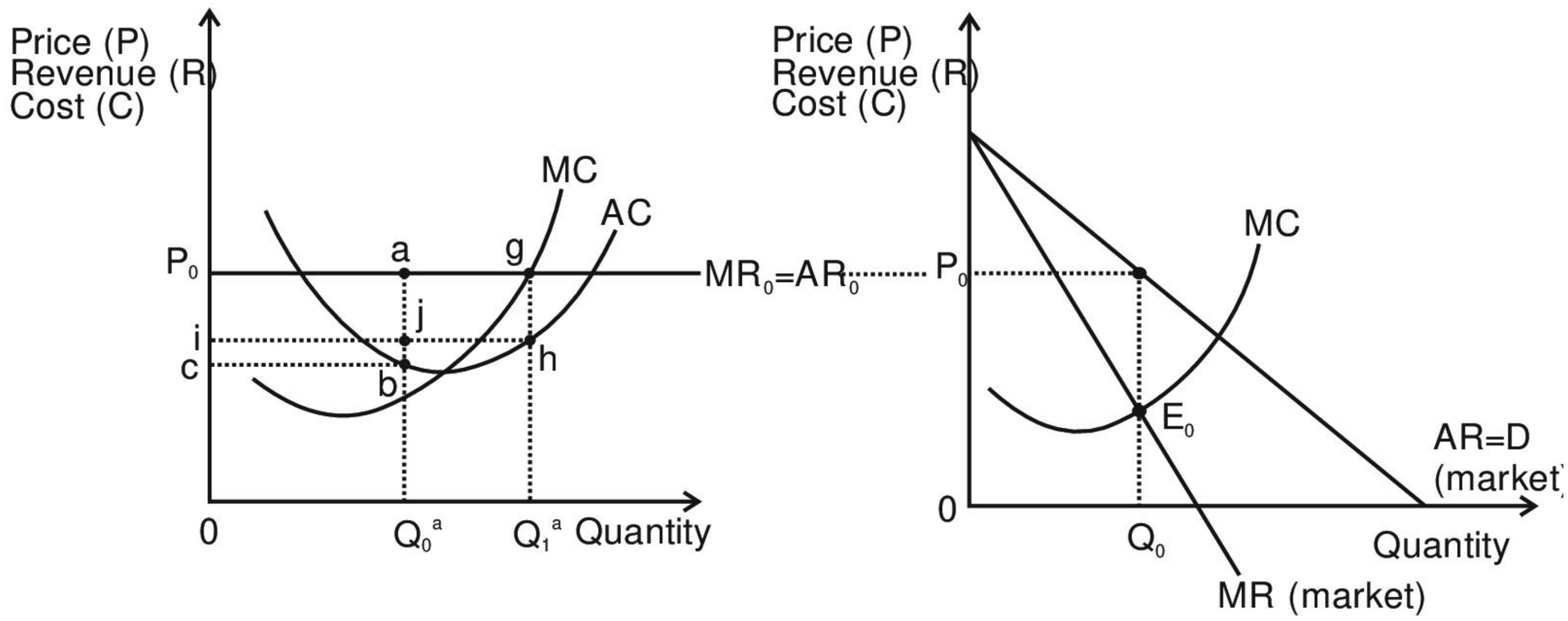
computed by multiplying the number of units produced by the difference between the industry price and the firm's average cost at that level of output. Firm A will earn abnormal profits of area P_0abc and firm B will make abnormal profits of area P_0def, as shown in the diagrams above.
The aggregate profit is then shared by the member firms in some agreed manner, not necessarily in the same proportion as actually contributed by each of the individual firms. Disputes over the sharing of aggregate profit frequently lead to the breakup of cartels. Other, looser forms of cartels like OPEC merely determine industry price jointly, but do not determine output quotas.

The cartel form of collusion is, however, inherently unstable, because the presence of a strong "**cheating incentive**" for cartel members. An individual firm can reap high profits (provided that other cartel members will stick to cartel policy) either by selling more than the quota allocated to it at the cartel price or reducing the price of its product secretly, e.g., by giving discount prices. The former case can be explained by the following diagram:



Firm A Industry

Let us assume that a cartel sets a fixed price P_0 in the market and allocates profits by selling quotas of the output each firm can sell. Suppose that, initially, firm A is allocated a sale quota of Q_0^a at price P_0 by the cartel. Firm A is earning supernormal profits, denoted by the area P_0abc. The firm will have a strong incentive to cheat and sell an output beyond its quota up to the point where P=MR=MC, i.e.,Q_1^a. At this output, the firm can earn extra profits, quantified by the area aghj, while incurring a loss of profits quantified by the area ijbc. As can be observed, the loss is far exceeded by the gain.

However, cheating by one firm will reduce the sales and profits of other cartel members, and so they will also start violating the cartel agreement, eventually resulting in a breakdown of the cartel, or causing a price war among the firms.

Factors determining the strength of the collusion (cartel and leadership)

It will be easier for firms to collude if the following conditions apply:

1. There are only a **few firms**, all well-known to each other.
2. They are **open with each other** about costs and production methods.
3. They have **similar production methods and average costs**, and are thus likely to want to change prices at the same time and by the same percentage.
4. They produce similar (homogeneous) products, and thus can more easily reach agreements on price.
5. There is one dominant firm.
6. There are significant barriers to entry and, thus, there is little fear for disruption by new firms.
7. The market is stable. If industry demand or production costs fluctuate wildly, it will be difficult to make agreements, partly due to difficulties in making predictions and partly because agreements may frequently have to be amended. A particular problem in a declining market is that firms may be tempted to undercut each other's prices in order to maintain their sales.

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8. There are <u>no government measures</u> to curb collusion.

Factors that weaken collusion:

1. **Number of firms:**
   If there are only a few firms, all well-known to each other, price collusion will be stronger—and vice-versa.
2. **Open to each other for cost and revenue information:**
   If firms are open with each other about costs, sales, revenue, and production methods, it is less likely for member firms to cheat. This would strengthen collusion.

3. **Homogeneity of the product:**
   Firms producing homogeneous products are more likely to face the same costs and demand conditions and, therefore, find it easier to collude. Firms with differentiated products are less likely to do so.

4. **Demand and cost differences:**
   When oligopolists face different costs and demand curves, it is difficult for them to agree on a price. This is particularly the case in industries where products are differentiated and change frequently. Even with highly standardized products, firms usually have different market shares and operate with different degrees of productive efficiency. Thus, it is unlikely that even oligopolists producing homogenous commodities would have the same demand and cost curves.

   In either case, differences in costs and demand mean that the profit-maximizing price will differ among firms; no single price will be readily acceptable to all. So, price collusion depends on compromises and concessions that are not always easy to make.

5. **Barriers to entry:**
   The greater prices and profits that result from a collusion may attract new entrants, including foreign firms. Since that would increase market supply and reduce prices and profits, successful collusion requires that colluding oligopolists block the entry of new producers by establishing high barriers to entry.

6. **Cheating incentive:**
   As the game-theory model makes clear, there is a temptation for collusive oligopolists to engage in secret price cutting to increase sales and profit. The difficulty with such cheating is that buyers who are paying a high price for a product may become aware of the lower-priced sales and demand similar treatment. Or buyers receiving a price concession from one producer may use the concession as a wedge to get even larger price concessions from rival producers. Buyers' attempts to play producers against one another may precipitate price wars among the producers. Collusion is more likely to succeed when cheating is easy to detect and punish. Then the conspirators are less likely to cheat on their price agreements.

7. **Government legislations:**
   Antimonopoly laws prohibit cartels and price-fixing collusions from forming. So less obvious means of price control have evolved in many countries.

8. **Number of firms**
   Other things equal, the larger the number of firms, the more difficult it is to create a cartel or some other form of price collusion. An agreement on price by three or four producers that control the entire market may be relatively easier to accomplish. But such an agreement is more difficult to achieve when there are, say, 10 firms, each with roughly 10% of the market, or where the big three have 70% of the market while a competitive group of 8 to 10 smaller firms battle for the remainder.

9. **Number of dominant firms:**
   The greater the number of big players in the market, the less likely it is that cheating firms will be punished, thereby weakening the effectiveness of the collusion.

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10. Recession

A long-lasting recession usually serves as an enemy of collusion, because slumping markets increase average total costs. In technical terms, as the oligopolists demand and marginal revenue curves shift to the left in response to a recession, each firm moves leftward and upward to a higher operating point on its average total cost curve. Firms find they have substantial excess production capacity, sales are down, unit costs are up, and profits are reduced. Under such conditions, businesses may feel they can avoid serious profit reductions (or even subnormal profits) by cutting price and, thus, gaining more sales at the expense of rivals.

Game Theory

Game theory analyzes competitive situations to determine the possible, probable, and optimal outcomes. Games consist of a set of **players** and a set of **strategies** for each player which are given or defined by rules. For each combination of players and possible strategies, there is a **payoff**.

Game theory was first developed by John von Neumann, and John Nash greatly expanded on existing game theory, helping to develop it much further.

Basic Example: The Prisoners' Dilemma

The prisoners' dilemma is a popular, basic, yet illustrative example of game theory. There are two prisoners, Tom and Gerry, who have just been captured for robbing a bank. The police don't have enough evidence to convict them, but know that they committed the crime. They put Tom and Gerry in separate interrogation rooms and lay out the consequences:

- If both Tom and Gerry confess they will each get 10 years in prison.
- If one confesses and the other doesn't, the one who confessed will go free and the other will spend 20 years in prison.
- If neither person confesses, they will both get 5 years for a different crime they were wanted for.

It is easier to see and compare these outcomes if they are put into a matrix:

		Gerry	
		Confess(C)	**Not Confess(NC)**
Tom	**Confess(C)**	10,10	0,20
	Not Confess(NC)	20,0	5,5

Since Tom's strategies are listed in rows, or the x-axis, his payoffs are listed first. Gerry's payoffs are listed second because his strategies are in columns, or on the y-axis. "C" means "confess" and "NC" means "not confess." This matrix is called "Normal Form" in game theory. Moves are simultaneous, which means that neither player knows the other's decision and decisions are made at the same time (in this example, both prisoners are in separate rooms and won't be let out until they have both made their decision).

At first glance, it may seem that both players not confessing is the best choice since each prisoner will only get 5 years, but a more in-depth look will show that this is not the case.

Dominant Strategy

By looking at each prisoner individually, we can find the dominant pure strategy. First look at Tom. Let's assume that Gerry is going to confess, what's the best strategy for Tom? If Gerry confesses and Tom

doesn't, Tom will go to prison for 20 years, but if he does confess he'll only go for 10. In this case, it's best for Tom to confess. Let's highlight this payoff in the matrix to keep track:

		Gerry	
		Confess(C)	**Not Confess(NC)**
Tom	**Confess(C)**	**10**,10	0,20
	Not Confess(NC)	20,0	5,5

Now let's assume that Gerry is not going to confess. If Tom confesses, he will go free, if he doesn't confess, he'll get 5 years. Again, his best option is to confess, no matter what Gerry does. Since in both cases his best option was to confess, confessing is his dominant pure strategy (it's also correct to say not confessing is dominated by confessing). A **dominant strategy** is a strategy that has the best payoff no matter what the other player chooses.

		Gerry	
		Confess(C)	**Not Confess(NC)**
Tom	**Confess(C)**	**10**,10	**0**,20
	Not Confess(NC)	20,0	5,5

Since Tom and Gerry both have the same options and payoffs, Gerry's dominant pure strategy is also confession. After going through the same steps, you can highlight your matrix as follows:

		Gerry	
		Confess(C)	**Not Confess(NC)**
Tom	**Confess(C)**	**10**,**10**	**0**,20
	Not Confess(NC)	20,**0**	5,5

Nash Equilibrium

You'll notice that the payoffs for (confess, confess) are both highlighted. Since both prisoners have the same dominant pure strategy, confess, they will both confess and each will get 10 years in prison. This is the Nash Equilibrium, named after John Nash. A Nash Equilibrium is any outcome where there is no unilateral profitable deviation—that is, holding all other players constant; one player cannot choose a strategy that will make him better off. In this case, if either player doesn't confess, he will get 20 years instead of 10. The payoff box (5,5) that results from (NC,NC) is *NOT* a Nash Equilibrium because either player could confess (holding the other player constant) and go free instead of spend 5 years in prison.

Application of game theory in oligopoly:

Suppose:

- There are of two firms, A and B, with identical costs and are producing homogenous commodities.
- Both charge a price of $4 and make a profit of $10 million each.

If both firms independently consider lowering their prices to increase profits:
By looking at each firm individually, we can find the dominant pure strategy.

Let us look at the case of firm A. If A views the whole situation pessimistically, it will assume that, despite keeping its price unchanged, firm B is going to lower its price to $3. What's the best strategy for firm A? If

firm B lowers its price to $3 and firm A doesn't, then firm A's profits will decrease to $2m, but if it does lower its price to $3, then profits will only decrease to $6m. In this case, it's best for firm A to lower its price to $3. This is known as the **maximin approach**, which involves choosing the better of the two options giving **lower returns.**

Payoff matrix

		Firm B	
		P_1 = $3 (Price cut)	**P_0 = $4 (No price cut)**
Firm A	**P_1 = $3 (Price cut)**	**$6 m, $6 m**	**$18 m**, $2 m
	P_0 = $4 (No price cut)	$2 m, **$18 m**	$10 m, $10 m

However, If A views the whole situation optimistically, it will assume that, when it reduces its price to $3, firm B will keep its price unchanged. If firm A lowers its price to $3, its profits will increase to $18m, if it doesn't lower its price to $3, its profits will stay at $10m. Again, its best option is to lower its price to $3, no matter what firm B does. This strategy is known as the **maximax approach**, where a firm chooses the better of the two options giving **maximum returns.**

Interestingly, A picks the same strategy, i.e., lowering the price to $3, whether it thinks optimistically or pessimistically. This is known as the **dominant strategy game**, where both approaches, maximin and maximax, lead to the same strategy.
The same scenario will apply to B, which will also be tempted to lower its price.

Nash Equilibrium

You'll notice that the payoffs for (price cut, price cut) are both highlighted. Since both firms have the same dominant pure strategy, to cut their prices, they will both lower their prices to $3 and each will get $6m. This is the Nash Equilibrium. In this case, if either player doesn't lower its price to $3, it will get $2m instead of $6m. The payoff matrix ($10m,$10m) that results from (no price cut, no price cut) is *NOT* a Nash Equilibrium because either player could lower its price to $3 (holding the other player constant) and increase its profits to $18m.

Merger and Integration (MCQs only)

A firm can grow in two ways. Firstly, by building new plants by ploughing back retained earnings and/or borrowing a capital fund from the market; and, secondly, by acquiring the assets of another firm. This second way is growth by acquisitions.

The word merger is the same that we give to the process of combining a number of firms (in most cases, two firms) into a single corporation. Growth by merger mainly occurs through acquisition.

The merger serves the objective of a cartel without bringing with it the problems associated with forming a cartel. Thus, a merger is essentially a collusive device. If the merger leaves the cost curves of the firms unaffected, there is no fundamental difference between a cartel and an equivalent merger.

There are three types of mergers: horizontal, vertical, and conglomerate merger.

1. **Horizontal Merger**: involves the combination of two firms in the same industry. Thus, two competitors are combined into a single corporation, e.g., a soft drinks company can acquire another soft drinks company.

2. **Vertical Merger**: involves the combination of two firms at different stages of production, e.g., firm A can buy firm B which is the supplier of an important input to firm A.

3. **Conglomerate merger**: involves the combination of two unrelated business areas, e.g., a cigarettes business can buy a hotel business. The firms try to diversify their business areas though a conglomerate merger.

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In the case of horizontal and vertical mergers, the acquiring firm increases its presence in the same line of business by acquiring either the competitor firms or the firms supplying key inputs. This tends to promote industry concentration. In the case of a conglomerate merger, a firm increases its presence in non-competing lines of business. This tends to promote country, cross-country, or even global concentration.

The motives of a merger are varied. Some of the important motives are discussed below:

1. Merging increases the sellers' **market power**, because the lesser the number of competing firms, the higher the degree of monopoly power. The collusion can be more easily accomplished if there are fewer firms in the industry. This is one of the main reasons why proposals for mergers are often rejected by the government.
2. Modern-day corporate firms are controlled more by their senior management than by their owners. The mergers can be effectively used to **promote the income and power of the managers**, because it has been amply demonstrated that the salaries of the senior managers are positively associated with the growth of the firm.
3. If the owner's profit-maximization goal is sacrificed to accommodate the executives' **pursuit of growth**, actual profit will fall below the potential level. As a consequence, the firm's share price will fall. The fall in share prices will provide an incentive to profit-oriented firms to take over the now-inferior firm and restore its profitability.
4. Oligopolists are not only the sellers but also the buyers of different inputs. The merger combines the oligopolists into a single entity and, therefore, increases the new corporation's share of purchases in the market for inputs. The newly formed corporation now has a **greater market power as a buyer**. This may enable the corporate buyer to obtain inputs at lower prices due to bulk purchases.
5. **Transaction costs** (costs other than price which are incurred in trading goods) are involved when firms purchase inputs from suppliers. A vertical merger can substantially reduce transaction costs by internalizing the production activities of the suppliers.
6. Conglomerate mergers are often used to **spread out risks**. The concentration of resources in a single line of activity is risky because every business has its good and bad times. But, fortunately, bad years in some sectors may be compensated by good years in other sectors. If investment is spread out by acquiring different product lines, the business loss in one line may well be balanced by profits in other areas. This helps to smoothen out profit fluctuations.

Whatever may be the motive for a merger, it is clear that mergers tend to increase the concentration ratio by restricting the number of competitors in the market.

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UNIT 8

Comparison of Market Structures

A2 Level
Microeconomics
Notes Book 3

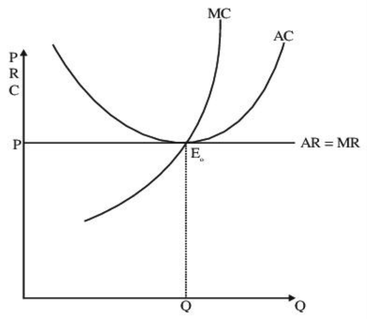
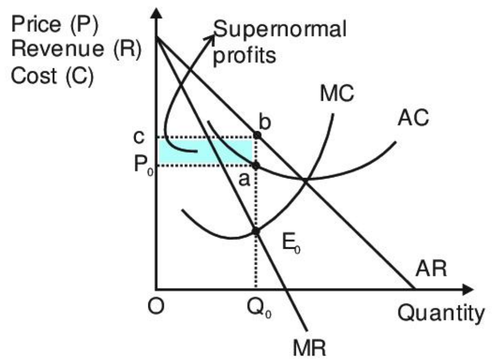
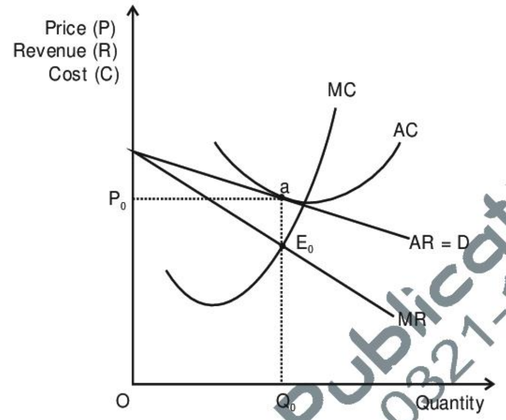
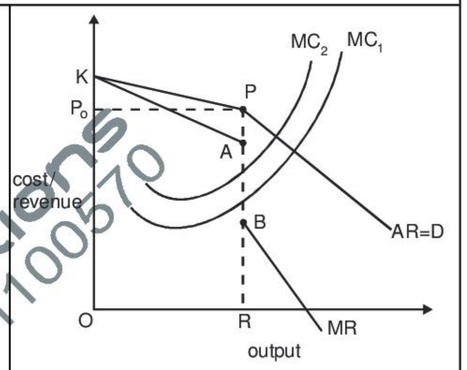
Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Comparisons of performance of firms:

- revenue
- output
- profits
- efficiency
- X-inefficiency
- barriers to entry and exit
- price competition
- non-price competition collusion

Unit 8 Comparison of market structures

Features	Perfect Competition	Monopoly	Monopolistic Competition	Oligopoly
1.Number of firms	▪ Large (1000's)	▪ Only one firm or one dominant firm	▪ Large (100's)	▪ Few large firms
2.Price Control	▪ No one buyer/seller can influence price–the firm is a price-taker	▪ Firm is a price maker	▪ Firm is a price maker	▪ Firm is a price maker
3.Barriers to entry	▪ None	▪ High	▪ No/Low	▪ Substantial
▪ **Natural Barriers:** high sunk costs (irrecoverable costs at the time of exit, e.g., depreciation, license fee, etc.), complete control over essential raw materials, control over retail outlets. ▪ **Artificial Barriers:** non-price competition, legal protection such as exclusive rights (copyrights, patents, tariffs, and quotas to stop foreign competition), mergers, excessive advertising, etc.				
4.Nature of products	▪ Homogeneous (identical) ▪ Buyers have no preference for any particular firm	▪ Unique product	▪ differentiated ▪ Differentiated means differences in quality, design, price, etc.	▪ Homogeneous or differentiated
5.Knowledge	▪ Perfect	▪ Imperfect	▪ Imperfect	▪ Imperfect
▪ Whether the seller knows rivals' prices, costs, and available technology. ▪ Whether buyers know all sellers' prices, quality, availability of products, and production costs.				
6.Firm's Revenue and demand curves	 ▪ MR= AR= P = D ▪ Can increase output without influencing price	 ▪ P=AR> MR ▪ Cannot increase both output and price at the same time as curve is downward-sloping	 P=AR> MR ▪ Some degree of control over own prices ▪ No single equilibrium price in the	 ▪ P=AR> MR ▪ Firm increases price; other firms will not ▪ Firm decreases price; other firms follow. Hence, kinked demand curve,

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			market—no market demand curve	interdependence, and price rigidity
Features	**Perfect Competition**	**Monopoly**	**Monopolistic Competition**	**Oligopoly**
7.PED	Infinity (perfect substitutes)	Very low (no close substitutes)	High (many close substitutes)	High for ↑ in price and low for ↓ in price
8.Market Share	Negligible	More than 25% with no substantial competitor	Low	Substantial with rivals
9.Examples	▪ Stock market ▪ Forex market ▪ Agricultural products: many farmers in LDCs	▪ Utilities like WAPDA or WASA in Pakistan ▪ Dee Bears in diamonds	▪ Restaurants, boutiques, bookshops	▪ Cars, soft drinks ▪ OPEC ▪ Providers of cellular services
10.Firm's SR equilibrium	▪ Equilibrium where MR= MC, provided that the MC curve is rising ▪ Supernormal (abnormal), normal/subnormal profits (losses)			
11.Firm's LR equilibrium	▪ Normal profits only	▪ May be normal/supernormal profits	▪ Normal profits only	▪ May be normal/supernormal profits
12.Productive efficiency	▪ Efficient ▪ Firm produces at MC=AC	▪ Inefficient unless by coincidence ▪ AC > MC	▪ Inefficient ▪ AC > MC	▪ Inefficient unless by coincidence ▪ AC > MC
13.Allocative efficiency	▪ Efficient ▪ P = MC	▪ Inefficient ▪ P > MC		
14.Dynamic efficiency	▪ Inefficient ▪ No Research & Development (R & D)	▪ Efficient ▪ R & D	▪ Inefficient ▪ No R & D	▪ Efficient ▪ R & D
15.Existence in real world	▪ No	▪ Least common	▪ Common	▪ Most common
16.Price discrimination	▪ No	▪ Yes	▪ Yes	▪ Yes
17.Interdependence	▪ No	▪ No	▪ No	▪ Yes
18.Price collusion	▪ No	▪ No	▪ No	▪ Yes
19.Concentration ratio* **	▪ Extremely low	▪ Almost 100 %	▪ Significant, but depends upon number of firms	▪ Low

***The **concentration ratio** of an industry measures the output of an industry's largest firm (or firms) as a proportion of the industry's total output.

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UNIT 9

Objectives, Discrimination and Contestability

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Differing objectives of a firm:

- traditional profit maximising objective
- principal agent problem, for example the divorce of ownership from control
- sales maximization
- survival, strategic
- satisficing

b. Price discrimination:

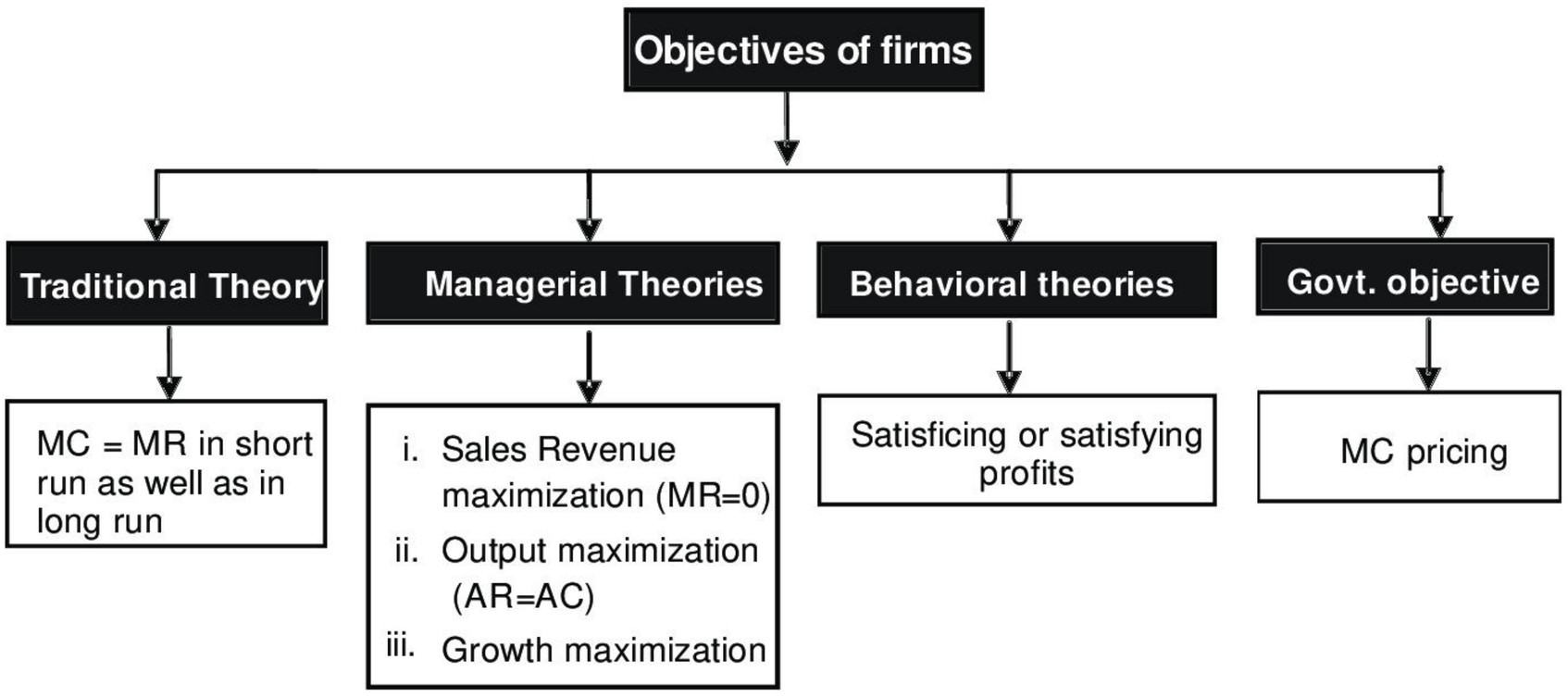
- meaning
- types
- conditions
- operations
- advantages and disadvantages

c. Contestable markets:

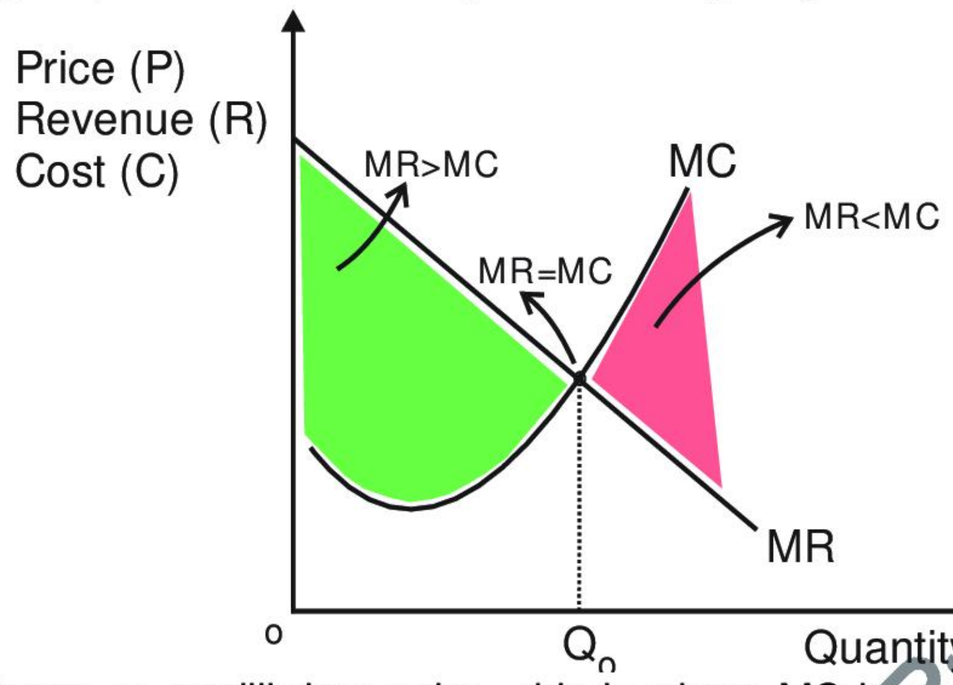
- meaning
- examples
- perfectly contestable markets
- limit pricing

Unit 9 Objectives, Discrimination & Contestability

Objectives of firms



- A firm maximizes its profit when producing an output for which marginal cost (MC) is equal to marginal revenue (MR), provided that the marginal cost curve is rising (with a positive gradient).
- As long as marginal revenue is greater than marginal cost (MR > MC), i.e., each extra unit of output costs less than the revenue generated from it, there is a profit margin that can be absorbed by increasing output. This is shown by the following diagram.



- The diagram above shows an equilibrium point—this is where MC is equal to MR. At this point, the firm is earning maximum profits. To the left of this point is an area for which MR exceeds MC. Producing an output below this (that is, below Q_0) will cause a loss in potential profits.
- To the right of the equilibrium point is the area for which MC exceeds MR. Producing an output beyond this (that is, beyond Q_0) will cause an incurrence of marginal losses. This is because each unit of output produced costs more than the revenue that it generates.
  - However, this theory of profit maximization is not always followed by firms.

Why are firms unable to maximize profits?

- It is difficult for firms to identify the profit-maximizing output because they are unable to calculate their marginal cost and marginal revenue. It is easier to calculate marginal costs when direct

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costs are involved. If many indirect cost factors are involved in a production process, it is difficult to figure out the exact marginal cost incurred by the production of additional output.

- Also, marginal revenue is determined from the demand curve. It is calculated as half the slope of the demand curve. The demand curve states that, ceteris paribus (i.e., other things being held constant), a change in price will result in a change in quantity demanded; but in reality this approach is unrealistic, as there are many other factors that affect demand. Hence, demand is not static, but is rater continuously changing, and so is marginal revenue. In practice, the calculation of MR at a certain point in time is impossible.

Why are firms not willing to maximize profits?

- If the profit-maximizing approach brings about supernormal profits for a firm, it can attract the attention of the government. Government bodies may then take antimonopoly actions against the firm, and so, in fear of this, firms might not produce at their profit-maximizing level of output.
- Large supernormal profits may also attract new firms into the industry, who will then reduce profit shares for existing firms. Existing firms might, then, not be willing to maximize their profits.
- High profits also damage the relationship between the firm and its stakeholders (for example, the consumer and the workers of the firm). With the profit-maximizing approach, the revenue earned by the firm will increase. If the demand for the product is inelastic, a producer will need to increase the price of the product and cut expenses in order to gain more revenue. The cuts in expenditure may take the form of wage decreases and/or decreases in spending on workplace conditions. Consumers will switch their expenditure on substitutes in the long-run. The workers may also, due to wage cuts, become less efficient and possibly go on a strike. To avoid all these complications in the long run, firms look at alterative objectives to profit maximization.
- Lastly, most businesses are in the form of public limited companies. In limited companies there is a divorce between ownership and control. Shareholders (the real owners) and the managers (the controllers) will have different approaches and objectives regarding the operation of the business. Managers who have decision-making authority will aim for reasonable profits but will not aim for maximizing profits at the expense of a reduction in their own benefits.

Alternative objectives of firms?

Therefore, due to all of the reasons stated above, firms look at alternative objectives.

1. Under the **sales revenue maximization** theory, the firm wishes to increase its total revenue. By increasing its sales revenue, the firm will expand its operations, which may eventually result in large profits. Under this theory the firm does not produce output for which MC=MR as in profit maximization, but produces beyond this point till MR is zero (MR= 0). As long as MR is positive, total revenue (TR) increases, but where MR is zero, TR is at its maximum. The mangers of a firm will focus more on this approach since their salaries, bonuses, and promotions, etc., are linked to an increase in sales rather than profit. A sales revenue maximizing firm may earn normal, supernormal, or subnormal profits, depending on its cost conditions and the elasticity of demand for its products.
A firm may decide to maximize its sales revenue when:

- It is following a penetration pricing policy to enter a new market
- To increase its market shares in the existing market.
- When the salaries and other benefits of managers are linked to the value of the sales of the company (i.e., revenue).

2. According to the **output maximization** objective, the performance of a firm is frequently measured directly in terms of physical output, with revenue occupying a secondary position. The firm will

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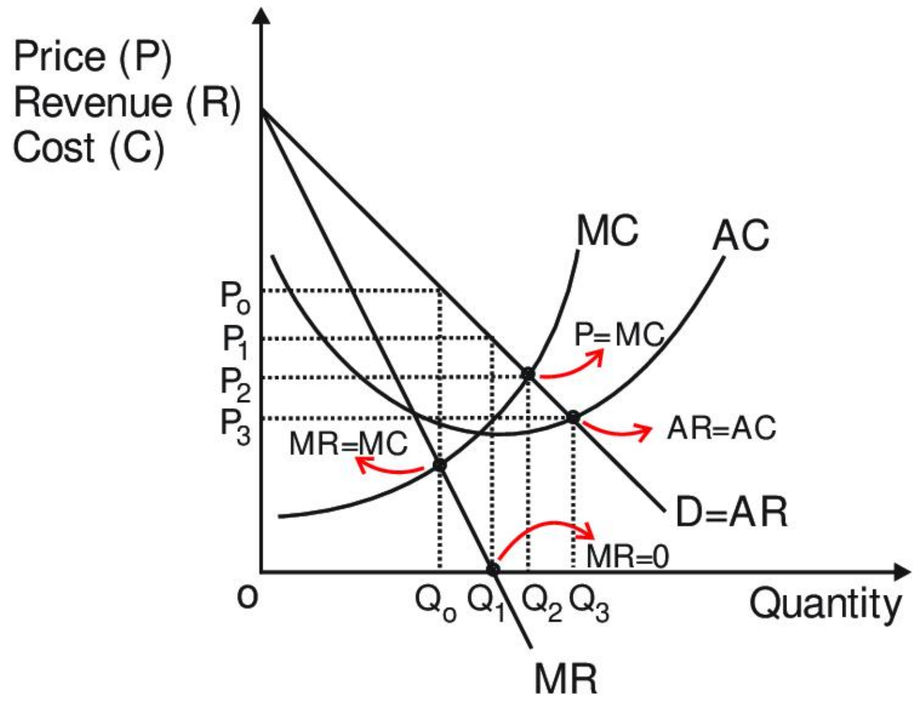
increase its output as long as it is profitable [i.e., till the point where average revenue is equal to average cost (AR=AC), as shown in the following diagram].



However firm may increase its production beyond OQ_3 if it decides to bear losses too for the sake of greater market share.

3. In **growth of assets maximization** firm desires to open new branches, set up new factories and expand the fixed assets. This will not only lead to higher production with more plants eventually more profits but will also increase the job prospects of managers and directors.

4. The **behavioral theory** examines the inherent conflict between the goals of individuals and subgroups within the organization and suggests that organizational objectives grow out of the interaction among these individuals and sub groups.

   Satisficing involves the people taking key day-to-day decisions in a business choosing to reach some minimum acceptable target, but not necessarily the maximum possible value. So, for example, the business might set a target of achieving a rate of profit above **normal profit,** but slightly below the profit-maximization output. This **minimum profit constraint** might be imposed by the shareholders of a business as a way of giving the right incentives to managers, but at the same time leaving them the liberty to pursue alternative aims in the short term, such as increasing sales, market share, or the size of the firm, each of which may be accorded equal or greater prominence than profits.

   A firm might, for example, be happy to set a slightly lower price and produce a higher output in the short term if it wants to gain control over more of the market, or perhaps because it wants to boost total revenue and cash flows rather than maximize its profit margin.

   The word 'satisfice' was coined by Herbert Simon in 1957, who was one of the first economists to question the basic assumption of perfect information and selfish rational behaviour by people operating in business. He argued that many businesses did not have sufficient information to make pure judgments about profit-maximizing price and output levels. Indeed, many operated using 'rules of thumb', guided by what their competitors might be doing and by their experience of having being in a market for some time.

   The satisficing principle leads us to consider a range of different price and output possibilities, and these are shown in the diagram between P_0 to P_4.

   In behavioural theory the firm aims to satisfy all of its stakeholders through different measures—such as allocating more profits to shareholders, implementing better working conditions, increasing perks

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and salaries for workers, lowering the price for consumers, pursuing social welfare for all of society—all of which were not paid attention to under profit maximization.

The problem with this approach to firm behavior is that it is not possible to define unequivocally what is meant by the term 'satisfactory' and, therefore, constructing a generalized theory of the firm is difficult; e.g., a profit return which is considered to be 'satisfactory' by one firm may be considered too low by some other firm. Thus, the predictive powers of satisficing theory are strictly limited.

5. If the government is monitoring the behavior of a firm for public interest, it may force the firm follow a marginal cost pricing policy—i.e., to produce an output for which P = MC. **Marginal cost pricing** (also known as an **allocatively efficient pricing** policy): A pricing principle which argues for setting prices equal to the marginal cost of production and distribution, ignoring whether or not fixed costs are recovered from revenues. The principle has been advocated as a guide to the pricing and output policies of public utilities on the grounds that prices which reflect the marginal cost to society of producing an extra unit of output are more socially desirable. The principle is particularly appealing when used for public utilities where marginal costs are effectively zero, such as parks, bridges, and museums, because here society can be made better off by lowering the price of these facilities until they are fully used.

However, the marginal cost pricing principle deals only with the short-run problem of generating an optimum price and output with existing capacity and ignores the long-run problem of ideal investment in new capacity. Whether MC pricing is possible or not depends on the costs of the firm.

Apart from those stated above, other reasons for firms not aiming for profit maximization may include market penetration, survival, or capturing market share in order to monopolize.

Which motive will dominate?

The dominance of a goal depends upon a number of criteria, including:

1. **Who owns the firm**
   Owners often have different objectives from those appointed to manage the firm's operations. For example, sole traders may try to maximize profits, whereas public limited companies (plc's) may try to increase shareholder value. In contrast, not-for-profit firms may simply wish to maximize their sales volume, or achieve some other, non-commercial objective.
2. **Who manages the firm**
   Firms that are managed by their owners, such as sole traders, may try to maximize profits, whereas firms run by professional managers may look to maximize sales revenue, given that they are usually paid a salary from revenue rather than from profit.
3. **The size of the firm**
   Small firms may simply hope to survive, whereas larger firms may expect to develop market share.
4. **The actions of competitors**
   If one firm, perhaps the dominant one, in a highly competitive market introduces a new strategy, it often ends up being shared by all other firms in the industry. The concern with ethical and environmental issues has gained momentum as, one-by-one, large plc's have introduced an ethical and environmental dimension to their operations. This is often called a 'bandwagon' effect.
5. **The time period being considered**
   In the short run, basic goals such as survival may dominate, while in the long run more challenging goals may dominate, such as maximizing shareholder value or introducing environmental goals.
   As time goes on, the goals of a firm change to adapt to the fluctuating circumstances that it finds itself in.

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Price Discrimination

Price discrimination is a situation in which either (1) a producer sells a good to different buyers at two or more different prices or (2) when the same consumer is charged different prices for the same product for reasons not associated with cost differences, e.g.:

- Different electricity charges to domestic and commercial users by WAPDA in Pakistan.
- Different prices for original and replacement parts for motor cars.
- Different prices for general the general public and students/senior citizens.
- Different prices charged by a firm for the same product in the local market in which it is a monopoly, and in the foreign market in which it is facing competition (especially in the case of dumping).
- Different fee charged by a surgeon for different clients.

Difference between price discrimination and price differentiation

Price differentiation includes a scenario when a product is priced high because its costs of production were high as well. Price discrimination occurs when different prices are charged in different markets for the same product produced by the same firm, assuming that the product incurs the same costs of production no matter where it is produced.

Methods of price discrimination:

1. **By time:** Different prices at different times, e.g., air fares and phone calls.
2. **By geography:** Different prices in different parts of a country or different prices for the same product in different countries (dumping).
3. **By use:** Different prices depending on whether you're a commercial user or a domestic user of electricity.
4. **By person:** A surgeon can charge different prices to its different clients.

Types of price discrimination

First degree	Second degree (block	Third degree
Each customer is charged his or her reservation price (the maximum price that they are willing to pay).	Different prices are charged for different blocks of the same good.	Same product sold at different prices to different customers.
Auctions.	Utilities or taxi fare.	Admission tickets to parks, etc.

Conditions for price discrimination

1. The firm must be a price maker. Price discrimination is impossible in perfect competition, in which firms are price-takers.
2. Firm must be able to separate the two markets. Resale by consumers in low price markets to those in high price markets should be prohibited, e.g., domestic users of electricity must not be allowed to resell it to commercial users.
3. Different markets should have different elasticities of demand, e.g., the demand by commercial users of electricity must be inelastic compared that of domestic users if the firm wants to charge them high prices.

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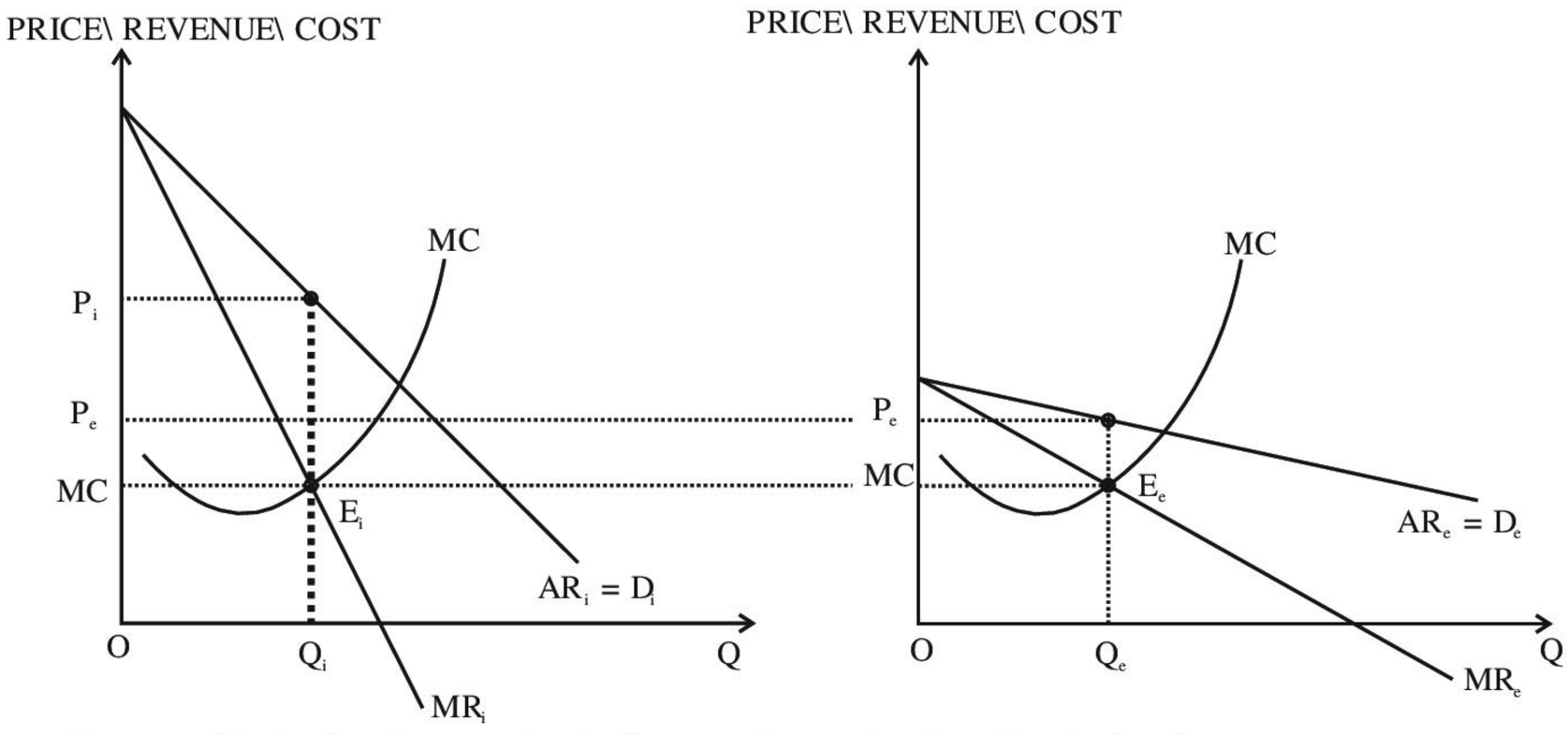
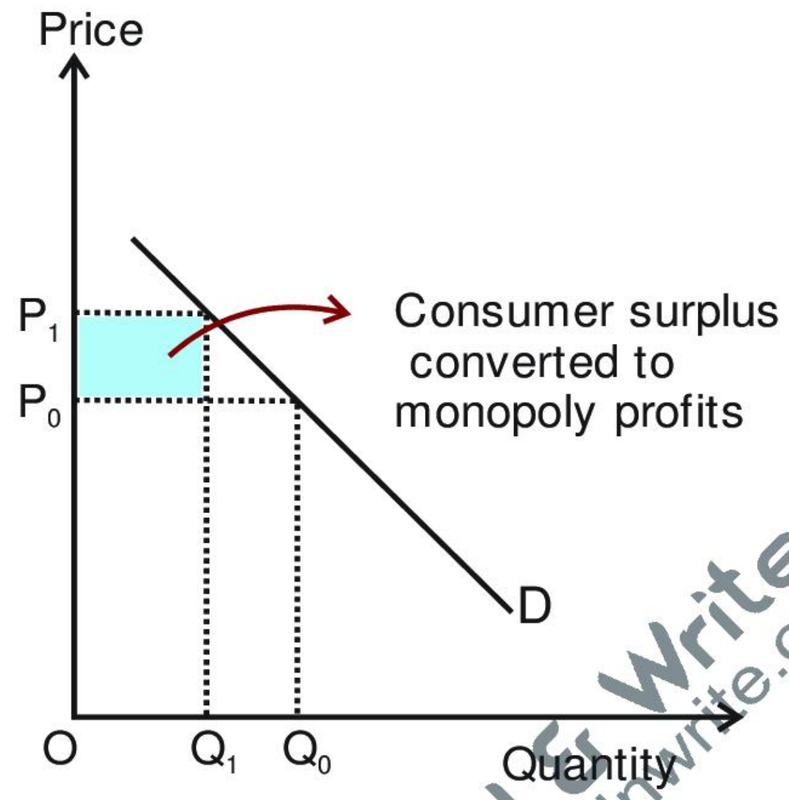


The above diagram illustrates how a single firm carries out price discrimination.

- The firm sets different prices in two markets—one in which the demand for its product is inelastic (left), and the other for which the demand for its product is elastic (right).
- The marginal cost curve for the firm remains MC in both markets.
- The profit-maximizing output is decided by checking overall MC=MR. Then the corresponding MR levels in both markets are compared to overall MC. This can be seen in the above diagrams, where both markets have different MR curves, but the same level of MC is intersected along both MR curves to establish the respective profit-maximizing output in each market.
- In the diagram on the left, the profit-maximizing output is Q_i, with price P_i.
- In the diagram on the right, the profit-maximizing output is Q_e, with price P_e.
- As can be observed, $P_i > P_e$. This allows the producer to maximize revenue, since a higher price is charged in the inelastic market, and a lower price is charged in the elastic market.

Disadvantages of price discrimination

1. Some consumers have to pay more than a single price.
2. A price discriminating monopolist earns its abnormal profits at the expense of consumer surplus.



Advantage/Justification of price discrimination

1. Price discrimination helps a monopoly in a market in which very **high costs** cannot be covered by the revenue generated by a perfectly competitive firm or a non-discriminating monopoly. Price discrimination generates more revenue; so, a discriminating monopoly is able to cover very high costs, enabling it to operate profitably where other firms will only incur a loss.

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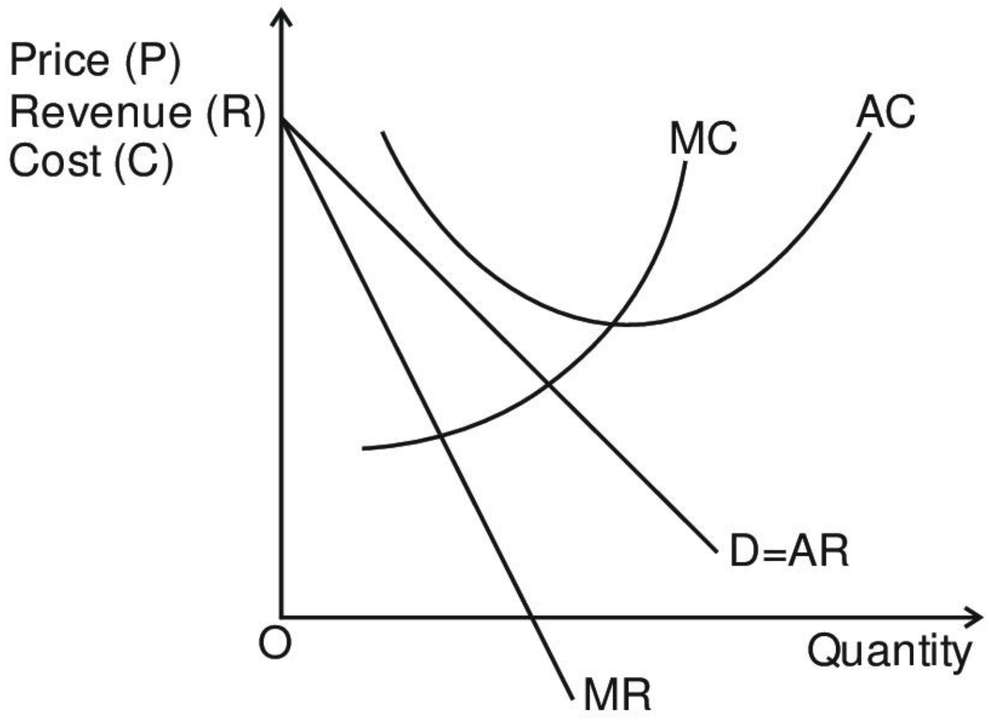
2.



3. Price discrimination might appear unfair to those who end up paying higher prices. However, at the same time, those **who are charged lower will be happier**, and will be able to afford commodities which they could not before, e.g., a poor patient will now be able to afford medical treatment from a renowned surgeon who charges very high prices for the rich but very low prices for the poor.
4. Price discrimination helps the monopolist to operate in markets where it is facing loses, ensuring the availability of a service to consumers; e.g., a non-discriminating monopolist will not provide rail travel in areas where the demand for it is low and its costs cannot be covered, but a discriminating monopolist will be able to generate more revenue from areas where demand for rail travel is high, and then use that revenue to subsidize the provision of rail travel in areas where the demand for rail travel is low. This is also called internal subsidizing, or the provision of a **cross subsidy**.
5. Price discrimination might have **social justification**. For a bus company it is fair to charge old people, children, and students prices lower than what is charged others.
6. Price discrimination can be used to drive out competitors from the market by charging high prices in markets where the demand for the monopoly's products are inelastic, and very low prices in markets where that demand is elastic. On the other hand, price discrimination also **starts a price war**, thereby increasing competition.
7. Price discrimination generates supernormal profits, which can be invested into **research and development**, product innovations, and process innovations which will benefit society.

Conclusion:

Price discrimination itself is not bad for society, but, rather, it is the aims and behavior of the monopolist which determine whether it will be beneficial or not.

Contestable markets

A contestable market is one with few or no barriers to entry. A fully contestable market would have no barriers to entry, whilst an 'incontestable' market would be impossible to enter. American economist William Baumol largely contributed to construct the theory of contestable markets. The threat posed by the possibility of new firms entering the market is taken to be a key determinant of the behaviour of existing firms. Contestability is a measure of the extent to which a market is open to new entry.

Certain distinct factors or characteristics can be used to identify a contestable market. Firstly, there are low barriers to entry, which means that there is both freedom of entry and exit into the marketplace. A major barrier to entry is sunk costs. Indeed, it was suggested by Baumol that markets would be contestable provided there were **no sunk costs.** Sunk costs will be low where the firm can sell or in other ways dispose of its capital equipment without incurring any costs associated with the disposal itself. For example, a new airline might lease aircraft rather than purchase them, and can then leave the industry at the end of the lease period without incurring any costs associated with attempting to sell the aircraft. This being said, there are still a number of ways to prevent firms from entering the market.

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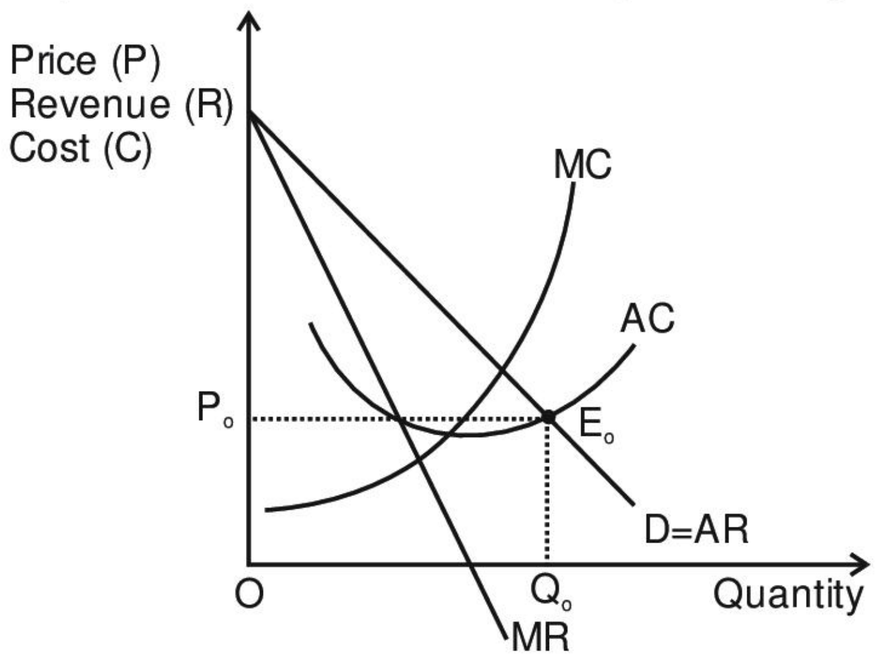
The number of firms in a contestable market can vary from one with complete control of the market, to many, with each firm having no significant share of the marketplace. Firms compete with each other; therefore, there is no collusion within the marketplace. Firms may produce a homogeneous or differentiated product. There is perfect knowledge in the market.

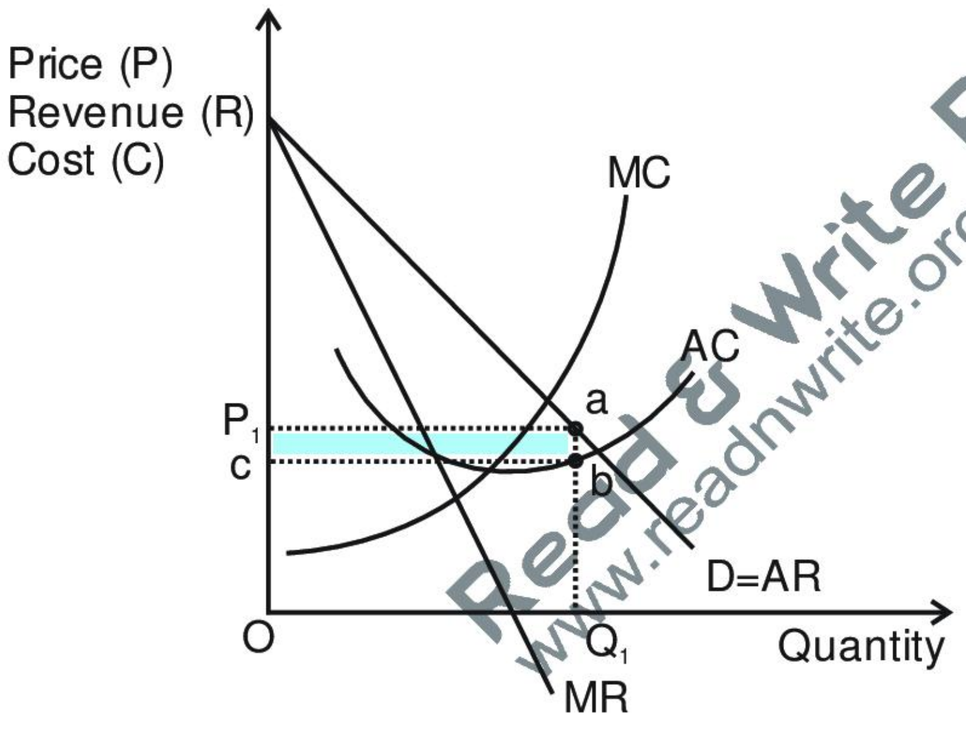
This theory leads to the idea of 'potential competition'. In an oligopolistic market with low barriers of entry, firms will realize that if they price their product too high, then competing firms will enter the market with lower priced alternatives. In order to prevent this firms will price their product competitively, regardless of whether there is any actual competition or not.Firms will set their prices at the highest level needed to deter new entry into the industry—a strategy known as **limit pricing**. It is this 'potential competition' that is of the greatest benefit to consumers. It keeps prices low and prevents the consumer from paying more for goods and services than they are worth.

At the extreme, a market with no barriers to entry or exit is **perfectly contestable**. The existence of supernormal profit, no matter how small, would trigger new entry in such a market. If a firm is producing with abnormal profit then the contestable market theory states that another firm will notice this (perfect knowledge) and enter the market with lower-priced products, safe in the knowledge that, should anything go wrong, exit costs are very low. This would, in the long run, cause a decrease in any abnormal profits that the original firm was making. This can be elaborated by the following diagram which shows that a perfectly contestable market will produce where AR=AC, at output Q_o and price P_o.



There are few, if any, markets in which no barriers to entry or exit exist at all. In practice then, just like perfect competition, contestability is a matter of degree: the question "is market X contestable?" requires more than a "yes" or "no" answer. In general, a market will be more contestable (more open to new entry):

Where existing firms have some protection because of barriers to entry or exit, however, they will be able to make supernormal profits. The extent of these supernormal profits depends largely on the height of the barriers. A contestable, but not a perfectly competitive, market may produce output Q_1 at price P_1 and make abnormal profits P1abc as shown in the following diagram below.



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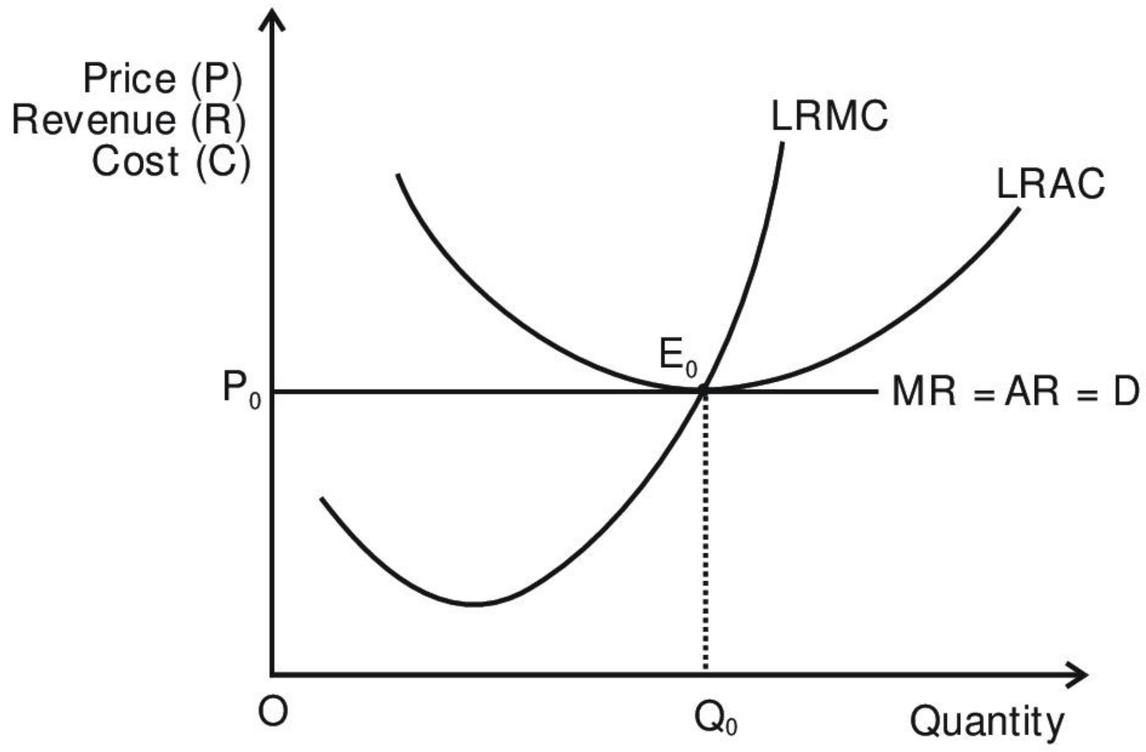
Markets which are highly contestable are likely to be vulnerable to “hit and run competition”. Consider a situation where present firms are pricing at above the entry-limit level. Even in the event that existing firms react in a predatory style, new entry will be profitable as long as there is a time lag between entry and the implementation of such action. Having made a profit in the intervening period, the new entrant can then leave the industry at little cost.

Theory of Excess Capacity

Theory of excess capacity is associated with monopolistic competition in the long-run and is defined as “the difference between ideal (optimum) output and the output actually attained in the long-run.” In the words of Professor Bobber: “ Under monopolistic competition, we are apt to witness too many firms all working under less than optimum capacity, all charging higher than competitive price, and all exercising the art of advertisement against each other in the effort to retain customers and to take them away from each other.”



Under perfect competition, however, the demand curve (MR=AR=D) is tangent to the long-run average cost curve (LRAC) at its minimum point and the double condition required for full equilibrium [LRMC = MR and AR(price) = minimum LRAC] is fulfilled. This means that, in the long-run, the entry of new firms forces the existing firms to make the best use of their resources, allowing them to produce at the lowest point on the average total cost curve. At this point, as shown in the diagram above, the firm will only earn normal profits, because MR = LRMC = AR = LRAC is at its minimum and OQ will be the most efficient output that the society will enjoy. This is the ideal output which firms produce in the long run.
Under monopolistic competition the demand facing the individual firm is not horizontal, but, rather, is downward sloping. A downward-sloping demand curve cannot be tangent to the long-run average cost curve at its minimum point. The two conditions required for equilibrium [LRMC = MR = AR(D) = minimum LRAC] will not be fulfilled. The firms will, therefore, be of less than optimum size even when they are earning normal profits. No firm will have an incentive to produce the ideal output, since any endeavor to produce more than the equilibrium output would incur long-run marginal costs that exceed marginal revenue, which would lead to less total profits.

Thus, every firm under monopolistic competition will be of less than optimum size and will operate with an unutilized excess capacity. This is illustrated in the diagram below:

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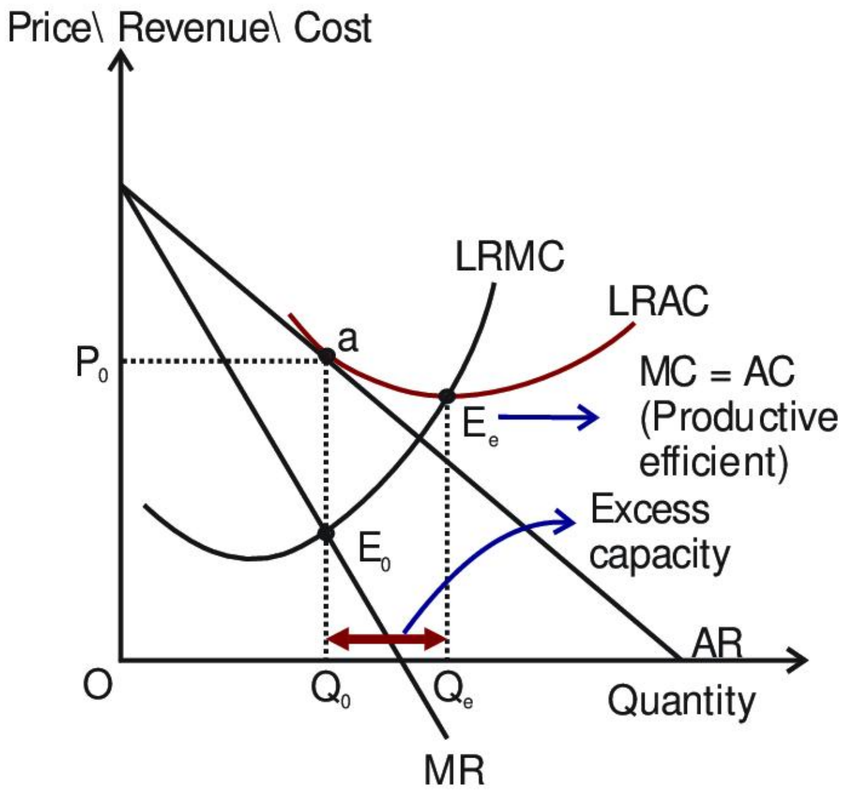

In the diagram above, the monopolistic competitive firm's demand curve is AR and its corresponding marginal revenue curve MR. LRAC and LRMC are the long-run average cost and long-run marginal cost curves, respectively. The firm is in equilibrium at E_0, where the LRMC curve cuts the MR curve from below. Q_0 is the equilibrium output, but not the ideal output, because the AR curve is tangent to the LRAC curve at point 'a', which is not the minimum point E_e. Any effort on the part of the firm to produce beyond Q_0 will incur marginal losses as, beyond the equilibrium point E_0, marginal costs exceed marginal revenue. Thus, the firm has excess capacity, measured by Q_0Q_e, which it cannot utilize while operating under monopolistic competition.

A comparison of the two equilibrium situations with the help of the diagram above will reveal that firms under monopolistic competition will not be working to their full capacity. There will be excess capacity and wastage. Each firm will be producing less, incurring higher costs, and charging a higher price than if they were operating in a perfectly competitive market. Firstly, profit-maximizing output in monopolistic competition is greater than that produced under perfect competition; and secondly, the profit-maximizing price in monopolistic competition exceeds that of perfect competition.

Past Paper Questions

Topic : Characteristics and comparison of market structures

(Nov 2014/P41/Q2/b)
Discuss what is likely to happen to the equilibrium price and output if a perfectly competitive firm were to become a monopolist. [13]

(Nov 2014/P41/Q3/a)
A consumer's demand is sometimes influenced by advertising and sometimes influenced by impulse buying. This means that the economic theories of consumer demand based on utility are of no relevance to a firm trying to determine its likely revenue.
Do you agree with this argument? [25]

(Nov 2014/P42/Q3)
Discuss the similarities and differences between a firm's likely price and output policy in perfect competition and oligopoly. [25]

(Nov 2012/P42/Q3/a)
Explain what is meant by an oligopoly market and why prices might fluctuate less in an oligopoly market than in a perfectly competitive market. [12]

(Nov 2012/P41/Q3/b)
It is said that perfectly competitive firms and monopolies aim to maximize profits. Discuss whether price, output and profit levels are, therefore, likely to be the same in perfectly competitive firms as in monopolies. [13]

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(Nov 2011/P41/Q3/b)
Discuss what economic theory suggests are the characteristics and possible behaviour of firms in an oligopolistic market. [13]
(Nov 2007/P4/Q3/b)
In 2005 London Energy stated that as a company it invested millions of pounds in improving efficiency to reduce costs. However, as world energy prices had increased significantly, it had been forced to increase the price it charged the customer.
London Energy has ceased to be a monopoly supplier in its region. Analyse how price and output might change as a market structure becomes more competitive. [13]
(Nov 2007/P4/Q2/b)
'We do not ask consumers what they want. They don't know. We decide what they will need and will want.' Akio Morita, founder of the Sony electronics company.
Discuss whether markets are dominated more by the producer or by the consumer. [13]
(Nov 2006/P4/Q4/a)
In 2004 the Chinese government approved a deal with BAT (formerly British American Tobacco) to enable them to become the first foreign manufacturer of cigarettes in China for at least 50 years. BAT said that it would invest $1.5 million in China and that it would take about two years before the factories were running efficiently. It is estimated that China has 300 million smokers and is the world's most important cigarette market.
Cigarette manufacture takes place in an imperfect market. Distinguish between the imperfect markets of monopolistic competition and oligopoly. [13]
(June 2004/P4/Q3)
Discuss the similarities and differences between a firm's behavior in perfect competition and oligopoly.[25]
(Nov 2001/a)
Contrast the features of perfect competition with those of oligopoly.[10]
(June 1999/a)
Distinguish between monopolistic competition and oligopoly.[12]
(June 1996/a)
Distinguish between perfect competition, monopolistic competition and oligopoly. [15]
(Nov 1995/a,b)
a. With reference to the characteristics of market structure, explain why a video rental shop is an appropriate example of monopolistic competition and the car manufacturing industry an appropriate example of oligopoly.[12]
b. Discuss how those businesses might compete in their respective market structures.[13]
(June 1992)
Analyse and comment upon the pricing and output decisions of the firm and the industry in perfect competition and monopoly.
(June 1991/a)
Give an example of a firm operating in conditions of monopolistic competition in the UK and an example of a firm operating as a monopoly. Explain your choices.[08]

Topic: Normal & Abnormal Profits

(Nov 2011/P41/Q3/a)
Explain what is meant by normal and abnormal profit and when such profits might occur. [12]
(June 2009/P4/Q2/a)
In many cities worldwide, newspaper publishers compete with each other. Some types of newspapers are sold, but publishers also produce others that are distributed free of charge. Many people and companies pay to advertise in the free newspapers.
Explain the different ways that economists classify profits and consider whether it is possible to make a profit from a newspaper that is distributed free. [12]
(Nov 2005/P4/Q4/a)
With the help of diagrams distinguish between normal profit and abnormal profit. [10]
(Nov 1998)
(a) Distinguish, with the aid of diagrams, between normal profits and abnormal profit.[10]
(b) Discuss how realistic it is to assume that firms want, and are able, to maximize profits. [15]
(June 1998)
'Supernormal profit can exist only in the absence of competition.' Discuss this assertion.[25]

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(Nov 1997) (b)
Why are there different levels of profits within perfect competition and between perfect competition and monopoly? [15]
(June 1993/a)
What is meant by normal profit? Explain when such profits may arise.[15]
(Nov 1992)
Why are there different levels of profits in perfect and imperfect markets?
(Nov 1990)
"If barriers to entry do not exist, an increase in demand for an industry's products will always lead to an increase in output at a lower price". Discuss
(Nov 1990/b)
Analyse the effects of a successful advertising campaign on
(i) the short run profits.
(ii) the long run profits of the firm whose good is advertised. [15]
(June 1990/a)
Analyse the effects of an increase in demand for petrol on the profits of filling stations.[15]
Distinguish, with the aid of diagrams, between normal profit and abnormal profit and explain when each may occur.[12]

Topic : Objectives Of Firms

(Nov 2014/P41/Q3/b)
Discuss what alternative objectives a firm might have apart from profit maximization. [13]
(November 2013/P41/Q2/b)
Discuss the possible choices a firm might face when deciding what business objective it should have.[13]
(June 2011/P42/Q4/b)
Explain the economic theory of profit maximization for a firm and consider whether firms are likely to follow this theory in fixing their price and output. [13]
(June 2011/P41/Q3/b)
Discuss whether the objectives of a firm in a perfectly competitive market are likely to be different from the objectives of a firm in an imperfect market structure. [13]
(Nov 2008/P4/Q3/b)
Discuss whether firms always want, and are able, to maximize profits as suggested by economic theory. [15]
(Nov 2005/P4/Q4/b)
Discuss whether firms always want to maximize profits and are able to do so in the way suggested by economic theory. [15]
(June 2003/P4/Q4/a,b)
There are often reports in the press that company profits have not risen as much as in previous years. As a result the company receives adverse criticism.
(a) Explain what a company might do if it wished to try to increase its profits.[13]
(b) Discuss what alternative objectives a company might have apart from profit maximization.[12]
(June 2001/b)
Discuss how realistic it is to assume that firms want to and are able to maximize profits. [13]
(June 1997/b)
Consider how far the above policy might fit into the traditional theory of profit maximization. [10]
(June 1995/b)
Given the above information, comment on the view that companies aim to maximize profits.[13]
(June 1990/b)
Given that an industry is in state ownership, what pricing policy should it be made to adopt?[13]

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Topic: Price Discrimination

(Nov 2014/P43/Q3/a)
Cunard is a company that operates large passenger liners providing transatlantic crossings between the US and the UK. Larger cabins, or cabins with balconies are priced higher than the smaller cabins. Also for any cabin, passengers purchasing the voyage in the US pay a much lower price than passengers purchasing the voyage in the UK. Cunard insist that in order to make the purchase in the US the passenger must have a US address.
Explain whether these are examples of price discrimination and consider whether price discrimination can be justified. [12]

(June 2010/P41/Q3/a)
In 2007 the cost of a single ticket on London trains bought at the time of travel was £4. The same ticket bought in advance was £2.50 if used up to 19.00 hrs and £2 after 19.00 hrs. Children could travel free at any time, and those over 60 could travel free after 09.00 hrs.
Explain what is meant by price discrimination and analyse what evidence there is of price discrimination in the above statement. [12]

(Nov 2002/P4/Q7)
(a) Explain with the aid of examples how price discrimination can operate.[12]
(b) Discuss whether price discrimination can ever be of benefit to consumers.[13]

(Nov 2001/a)
Explain how monopolies discriminate between buyers by charging different prices for the same product or services. [10]

(June 2000/a)
Air fares on major airlines cost more during periods such as summer holiday time when demand is higher. Explain how price discrimination can occur and consider whether this is an example of price discrimination.[12]

(Nov 1996)
Air fares on major airlines from South Africa to London and Europe will cost during peak travelling seasons. The fares are to be fixed by a twenty-strong group of airline companies.
Explain how price discrimination can occur, and consider whether the above situation is an example of price discrimination in operation.[12]

(Nov 1991/a)
A recent newspaper report stated that a Japanese businessman had been fined for going to Taiwan to purchase Japanese manufactured goods, re-importing them to Japan and selling them at a price below the current market price. His offence was to breach the practice of price discrimination.
a. Explain what price discrimination is and the circumstances necessary for it to be both successful and profitable. [10]
b. Explain what price discrimination is and the circumstances necessary for it to be both successful and profitable. [10]
c. How did the actions of the Japanese businessman affect the practice of price discrimination? [5]
d. Who benefits and who loses as a result of the actions of the Japanese businessman?[10]

Topic : CONTESTABLE MARKETS

(Nov 2009/41/Q3/b)
BG is a rapidly growing energy company with operations in 25 countries engaged in the exploration, production and distribution of natural gas and oil. This requires complex chains of physical infrastructure, major investment funds and detailed commercial agreements with different countries.
Discuss whether companies that supply energy are likely to operate in contestable markets. [13]

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UNIT 10

Economic Efficiency and Market Failure

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

f. Efficient resource allocation
- productive efficiency
- allocative efficiency
- Pareto optimality
- dynamic efficiency

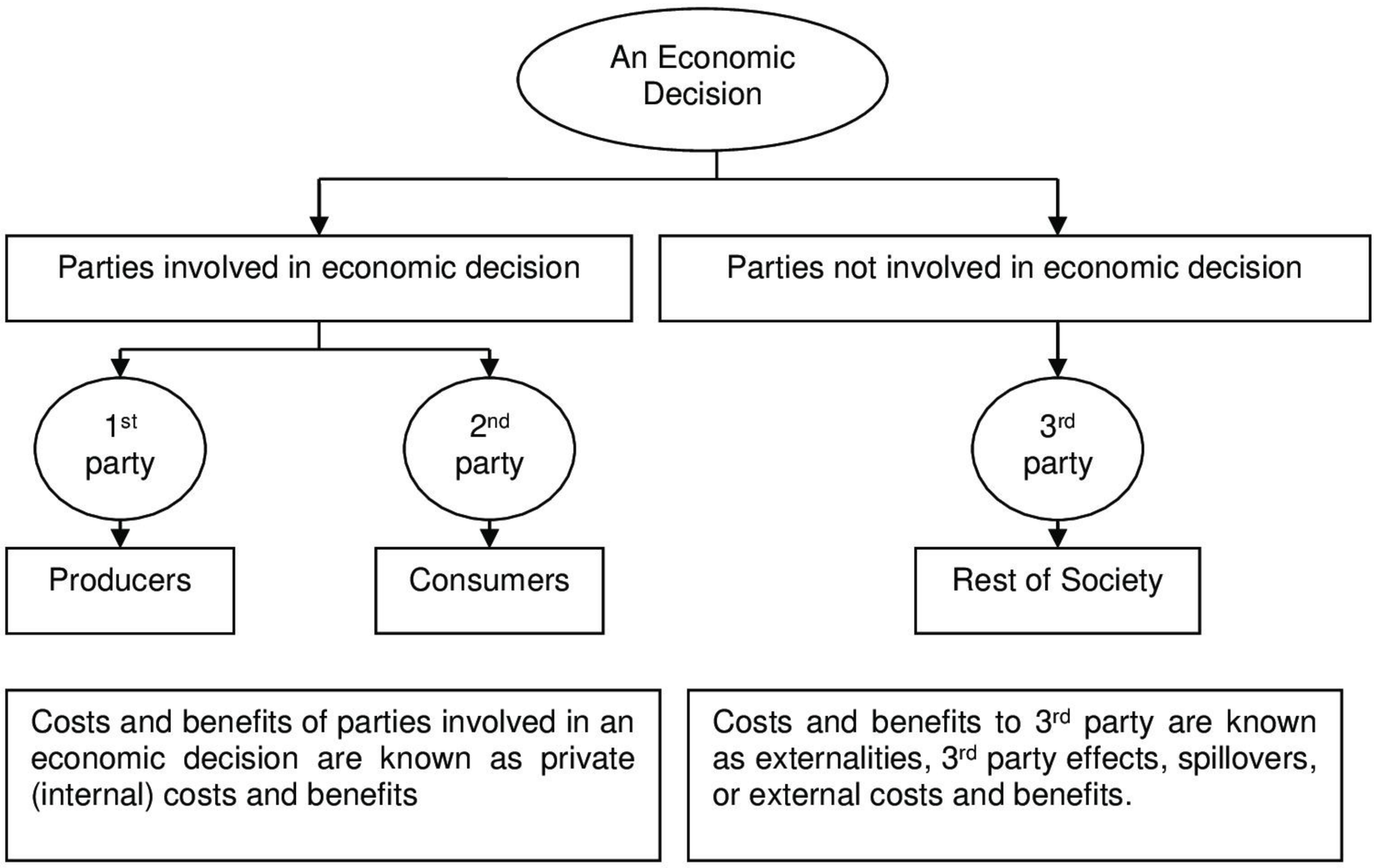
g. Externalities and market failure
- reasons for market failure
- positive and negative externalities for both
- consumers and firms
- inefficient resource allocation

h. Policies to achieve efficient resource allocation and correct market failure
- application of indirect taxes and subsidies
- price and output decisions under nationalization and privatisation
- prohibitions and licences
- property rights
- information
- regulatory bodies
- deregulation
- direct provision of goods and services
- pollution permits
- behavioural insights and 'nudge' theory

i. Government failure in microeconomic Intervention
- effectiveness of government policies

j. Social costs and benefits
- cost-benefit analysis
- social costs as the sum of private costs and
- external costs
- social benefits as the sum of private benefits
- and external benefits
- use of cost-benefit analysis in decision-making

Unit 10 Economic Efficiency and Market Failure


An Economic Decision
Parties involved in economic decision
Parties not involved in economic decision
1st party
2nd party
3rd party
Producers
Consumers
Rest of Society
Costs and benefits of parties involved in an economic decision are known as private (internal) costs and benefits
Costs and benefits to 3rd party are known as externalities, 3rd party effects, spillovers, or external costs and benefits.

Concepts and Definitions

Abbreviation	Stands For	Meaning/Definition
M	Marginal	Change in a certain value due to a unit change in a variable
C	Cost	Expenses and opportunity cost
B	Benefit	Utility or revenue
P	Private	Associated with parties that are directly involved, i.e., producers and consumers
E	External	Associated with third parties, i.e., the rest of society, who are not directly involved
S	Social	To the entire society, i.e., all three parties (producers, consumers, and the rest of society as well) → S= P+E
N	Net	Benefit –Cost
PC	Private Cost	Cost of an economic activity incurred by those directly involved, i.e., producers, consumers, etc. Examples include wages, rent, and fuel for the producers and the expenditure on the commodity for the consumers.
EC	External Cost	The cost of economic activity incurred by third parties, e.g., pollution, noise, etc.
SC	Social Cost	The total cost of economic activity, incurred by all parties, i.e., SC = PC + EC
PB	Private Benefit	It is the benefit of an economic activity to the producers and consumers .i.e. directly involved parties .e.g. revenue and utility.
EB	External Benefit	Benefit of an activity to the third party e.g. more employment opportunities in the area in other businesses
SB	Social Benefit	Benefit of an activity to all three parties
NPB	Net Private Benefit	Net Private Benefit (NPB) = total profit NBP = PB – PC and Profit = Revenue – Cost

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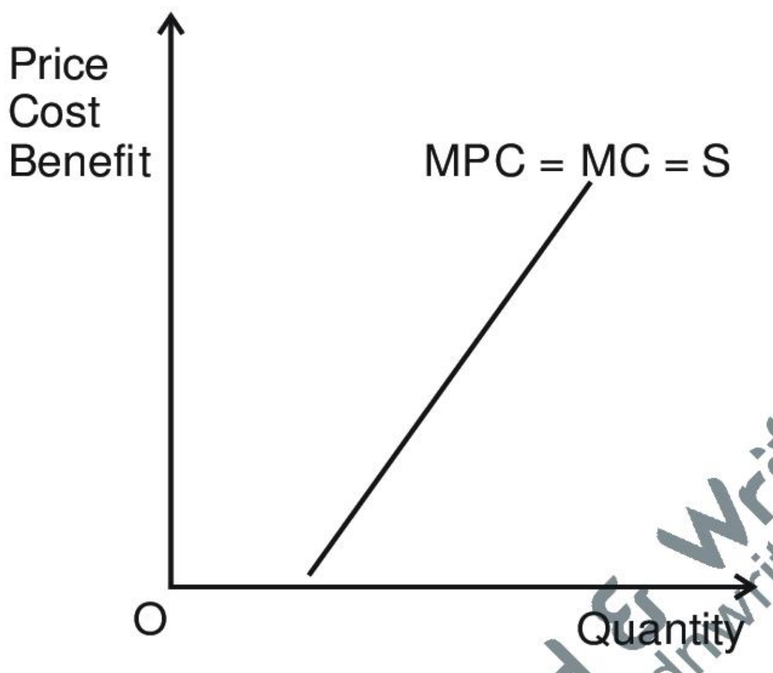
NSB	Net Social Benefit	NSB = SB – SC
MC	Marginal Cost	Cost of an additional unit of output produced
MPC=PMC	Marginal Private Cost	It is the cost of an additional unit to the directly involved parties
EMC=MEC	External Marginal Cost	It is the cost of an additional unit to the third party
SMC=MSC	Marginal Social Cost	It is the cost of an additional unit to the whole society. MSC = MPC + MEC
PMB=MPB	Private Marginal Benefit	Private benefits of an additional unit
EMB=MEB	External Marginal Benefit	Benefit of an additional unit to the third party
SMB	Social Marginal Benefit	Benefit of an additional unit to all three parties SMB = PMB + EMB
NPMB	Net Private Marginal Benefit	Net Private Marginal Benefit NPMB = PMB + PMC
NSMB	Net Social Marginal Benefit	NSMB =SMB – SMC
NPTB	Net Private Total Benefit	PB-PC=∑(PMB-PMC)
NSTB	Net Social Total Benefit	SB-SC=∑(SMB-SMC)

MPC=Marginal Private Cost:

As we know that supply is derived from the rising portion of the marginal cost curve above the average variable cost curve, therefore MPC curve is also upward sloping, as shown in the figure below:

MPC = MSC – MEC



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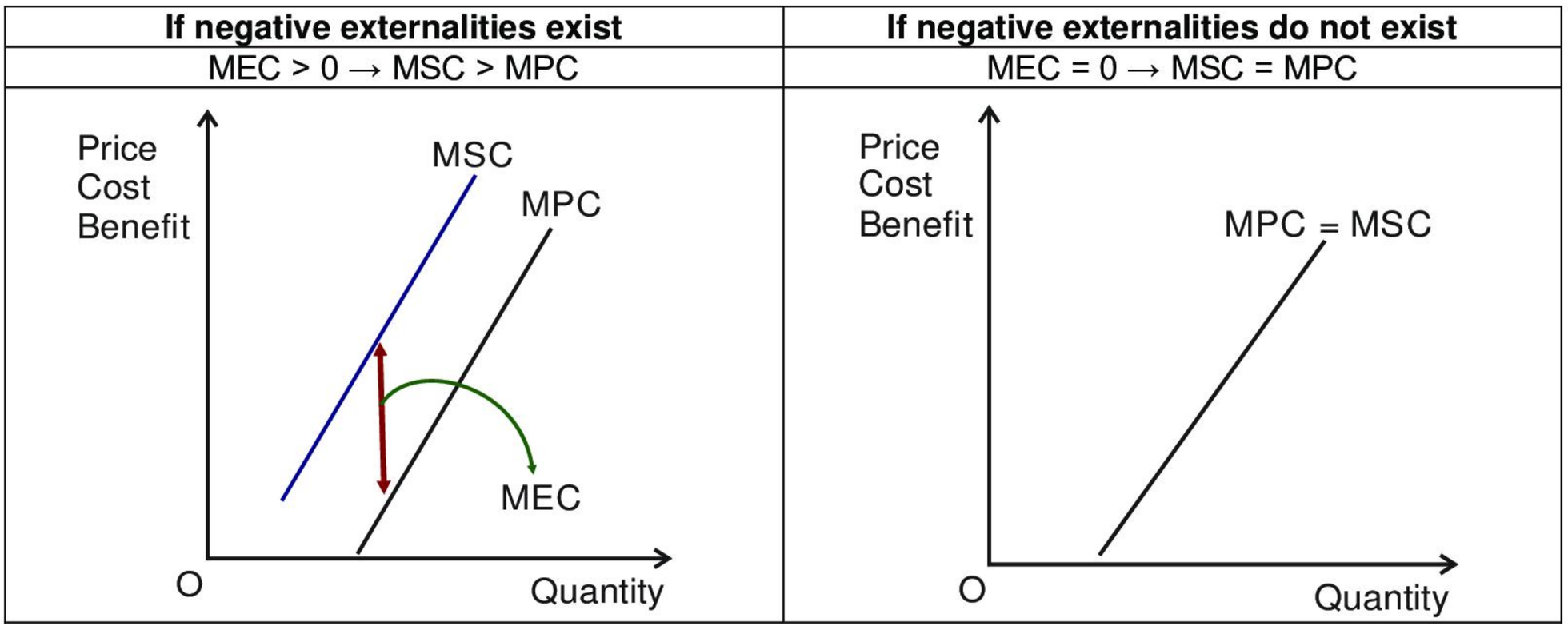
Marginal Social Cost (MSC)

Marginal social cost is the cost of production and consumption of an a extra unit of output to the whole society including marginal private cost and marginal external cost.

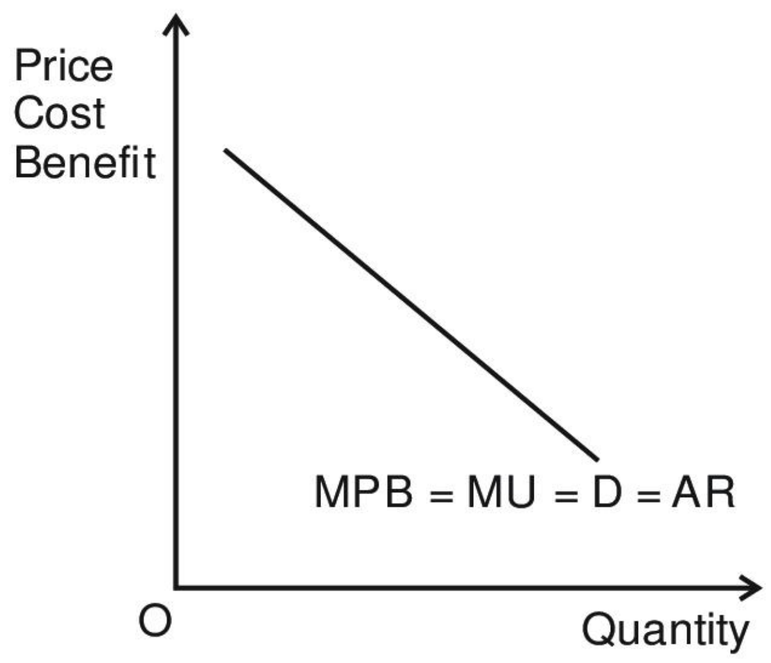
MSC = MPC + MEC



Marginal Private Benefit (MPB)

Marginal private benefit is the benefit of an additional unit of output produced and consumed to the directly involved parties in an economic decision, i.e., producers and consumers.
Producers receive benefits in the form of revenue and consumers derive utility from consumption. MPB is downward sloping and equal to the demand curve.

MPB = MSB – MEB



Marginal Social Benefit (MSB)

Marginal social benefit is the benefit of an additional unit of output produced or consumed to the whole society including marginal private benefit and marginal external benefit.

MSB = MPB + MEB

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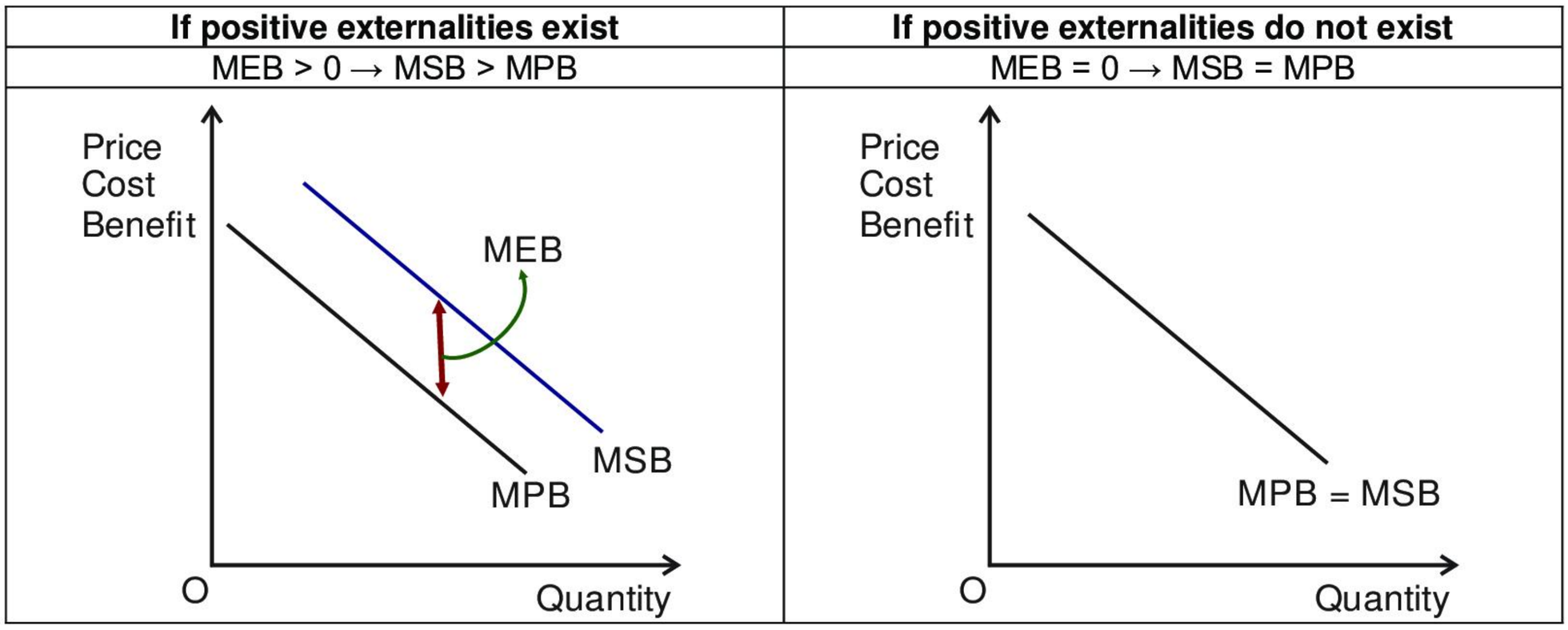
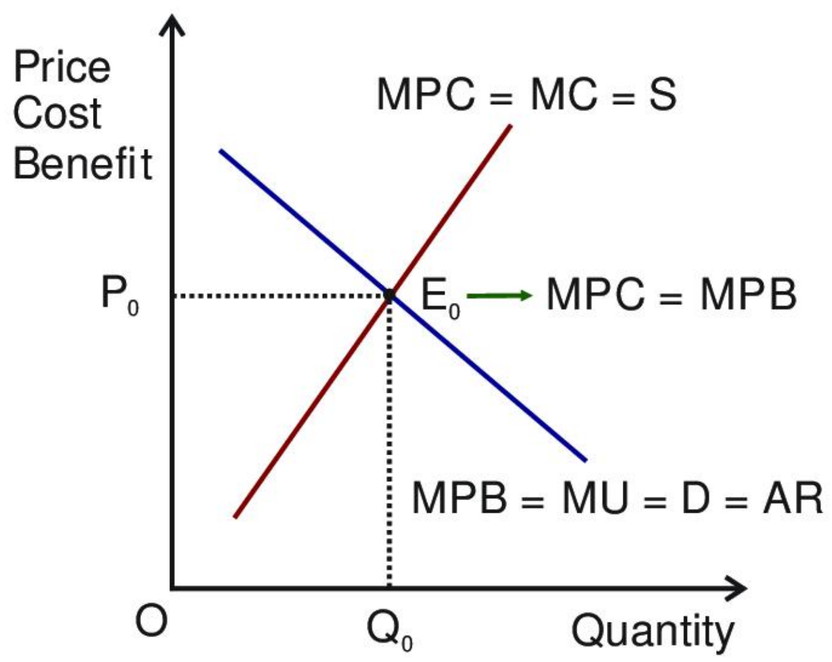


Net Private Benefit (Profit-maximizing) Output

In free market economy, producers and consumers will maximize their profits and utility (i.e., net private total benefit) where

MPB = MPC

Irrespective of any positive or negative externalities they are creating.



Net Social Benefit Maximizing or Socially Optimum Output Economic Efficiency: (Pareto Optimality)

Allocation of Resources:

This is the allocation on an economy's factors of production between alternative uses in line with patterns of consumer demand.

Optimum Allocation of Resources:

- Resources are optimally allocated when the proportions in which factor inputs are combined to produce goods and services reflect their relative costs so as to minimize cost of production, and when the output of goods and services fully reflects the distribution of consumer preferences as between those goods and services (Pareto optimality).

- More specifically, resources are optimally allocated when the proportions in each market the price paid for the good or service fully reflects the lowest economic cost of supplying it.

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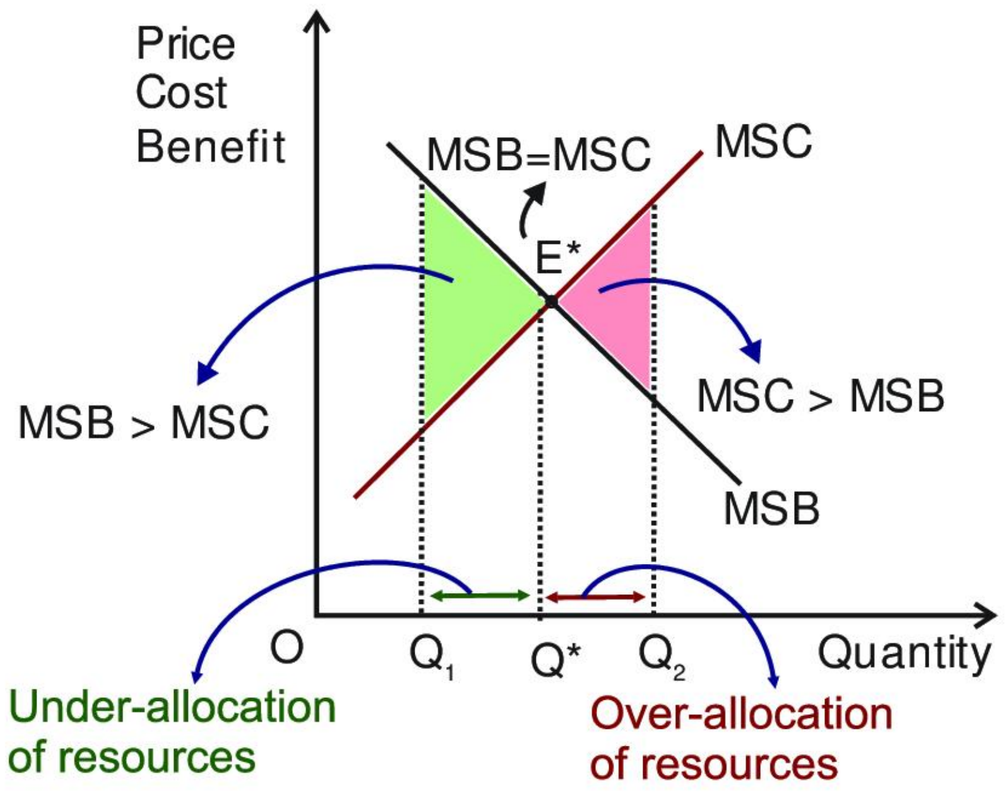
- Economic efficiency is a situation where it is impossible to make someone better off without making someone else worse off.

- Alternatively, socially optimum output (which can also be called the allocatively efficient output) is achieved where the:

MSB = MSC

Quantity	MSB	MSC	NMSB=MSB- MSC	Social Welfare = NSTB=∑(MSB - MSC)	Allocation of resources
1	20	6	+14	+14	Under-allocation of resources
2	18	8	+10	+24	
3	16	12	+4	+28	
4	**14**	**14**	**0**	**+28**	Optimum allocation of resources
5	12	16	-4	+24	Over-allocation of resources
6	10	18	-8	+16	
7	8	20	-12	+4	



- If SMB < SMC, last unit of good less than opportunity cost of producing that unit – society benefits from not producing that last unit
- If SMB > SMC, last unit of good more than opportunity cost of producing that unit – society benefits from producing that last unit

- Economic efficiency is a criteria to judge the effectiveness of resource allocation in the economy as a whole such that individual goods and services are being produced at minimum cost through best combination of factor inputs (Productive efficiency) as well as produced goods and services are most desirable by the consumers in the society (Allocative efficiency). This is achieved where:

P = MC = AC

- The aforementioned criterion of economic efficiency assumes that there is no market failure of externalities/public goods/merit or demerit goods.

According to P=MC=AC criterion, economic efficiency has two aspects:

a. Productive efficiency
b. Allocative efficiency

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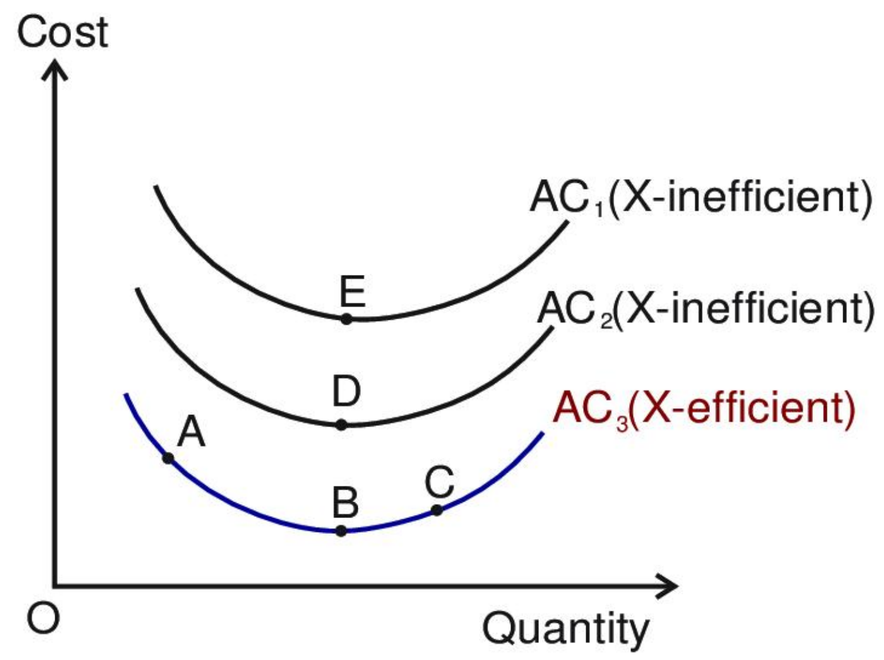
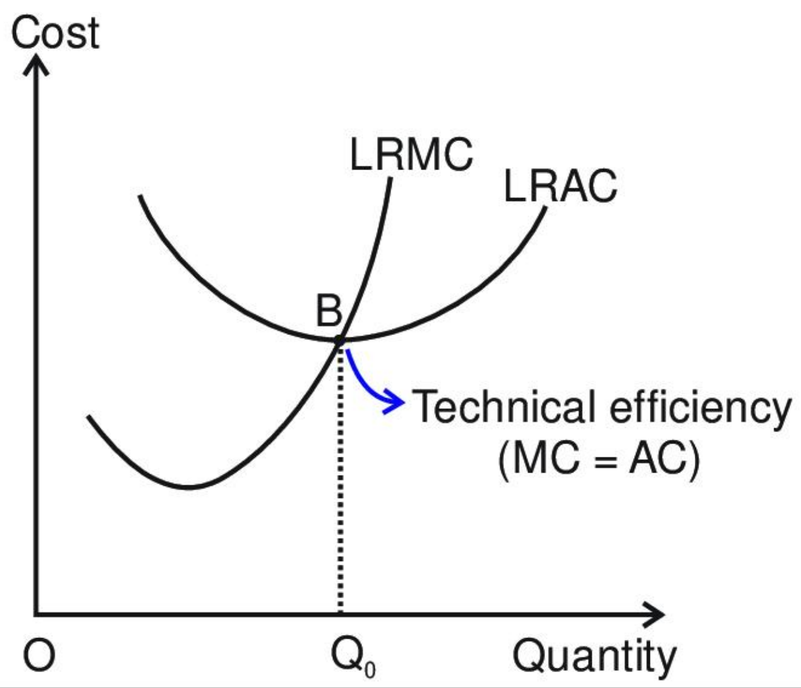
Productive efficiency (PE)

Productive efficiency is a situation where goods and services are produced at minimum possible cost using least possible resources. To understand the productive efficiency, when a firm's cost curves are considered, there are two aspects of lowest possible cost.
Producing at:

a. Lowest possible AC curve (X-efficiency)
b. Lowest possible point on a given AC curve (technical efficiency)

X-Efficiency	Technical Efficiency
A firm producing at the lowest possible AC-curve is said to be X-efficient. Here in the diagram there are three possible AC curves:	Technical efficiency is a situation in which a firm produces at the lowest point on the given AC curve .Lowest point of AC is where MC cuts AC, i.e., **MC = AC**
	
A firm can be X-efficient only if it produces at the lowest possible AC curve (i.e., AC_3). All firms producing above their lowest possible AC curve will be X-inefficient. All points on AC_3(e.g., A, B, and C are X-efficient). **Sources of X-inefficiency** • Lack of competitive pressures to keep firms operating at lowest possible AC curve especially in monopolies. • Lack of incentive to invest in process innovation (improvement in technique of production) through research and development. • By following the old traditional methods	So necessary condition for a firm to be technically efficient, its equilibrium must establish where, MC = AC (i.e., the lowest point of the lowest AC curve). Presence of normal and abnormal profits and slope of MR of a firm along with its objective, determines whether it will be or will not be technically efficient. Technically efficient point of production can be shown by the diagram above. All the points before OQ_0 or beyond OQ_0 will generate higher points on AC, hence technically inefficient if it produces OQ_0 output where MC = AC, i.e., minimum point of AC.

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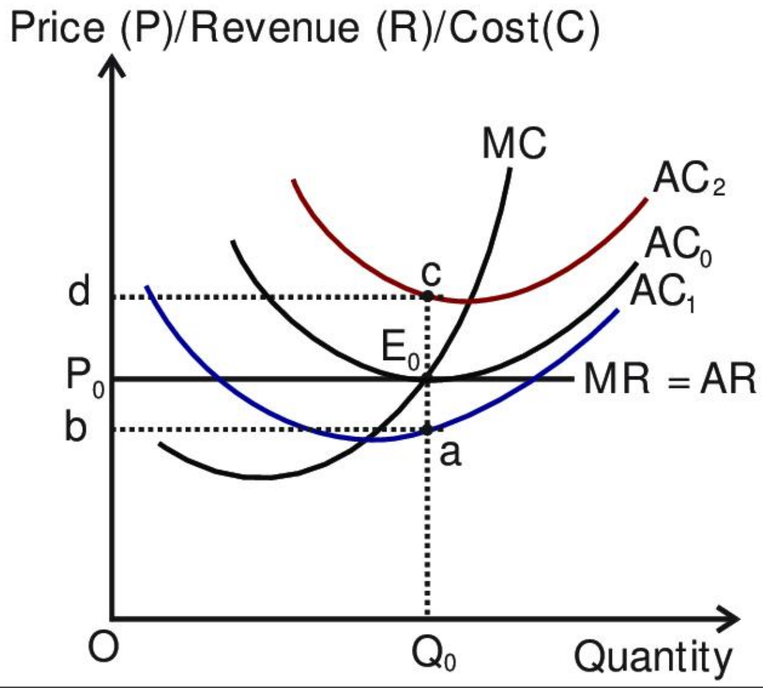
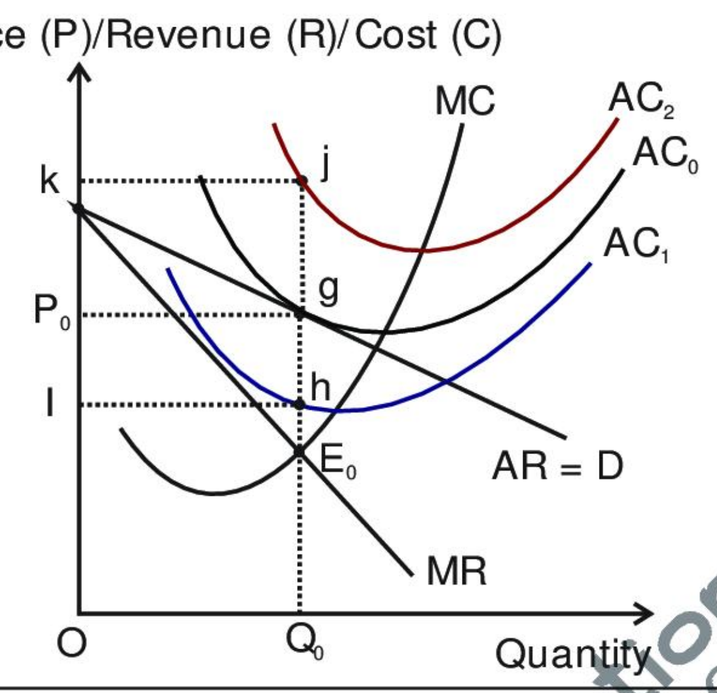
of production and business. • By lack of profit maximizing behavior, especially in less developed countries where owners of the factors of production are content with their current level of material welfare and don't want to maximize their profits at the expense of traditions they have inherited. • X-inefficiency also appears in large organizations (monopoly and oligopoly) where firms operate with poor management and coordination. Labour unions are also a source of X-inefficiency in these organizations when they force firms to employ more than efficiently required workers (this situation is known as over manning).	**Productive Efficiency = X-efficiency + Technical Efficiency** Hence productive efficiency will be achieved when a firm produces at the lowest point of lowest possible average cost curve. As x-inefficiency is rare to exit therefore technical efficiency is taken equal to productive efficiency.

Productive Efficiency and market structures:

Perfect competition	Imperfect Markets
	(Monopoly, oligopoly,& monopolistic competition)
	
MC | **AC** | **Profits** | **MC & AC** | **PE** E_0Q_0 | $AC_0 = E_0Q_0$ | Normal | $MC = AC_0$ | ✓ E_0Q_0 | $AC_1 = aQ_0$ | Abnormal | $MC > AC_1$ | × E_0Q_0 | $AC_2 = cQ_0$ | Losses | $MC < AC_2$ | ×	**MC** | **AC** | **Profits** | **MC & AC** | **PE** E_0Q_0 | $AC_0 = gQ_0$ | Normal | $MC = AC_0$ | × E_0Q_0 | $AC_1 = hQ_0$ | Abnormal | $MC < AC_1$ | × E_0Q_0 | $AC_2 = jQ_0$ | Losses | $MC < AC_2$ | ×
Hence, perfect competition is only productively efficient when there are normal profits.	Hence, imperfect markets are productively inefficient with all types of profits. The more the difference between price and marginal cost, the more allocative inefficiency there is. Allocative inefficiency (AI) in monopoly **>** AI in oligopoly **>** AI in Monopolistic competition

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Allocative Efficiency (AE)

Productive efficiency alone does not ensure the efficient allocation of resources. Least-cost production must be used to provide society with the right goods—i.e., the goods that consumers want most.

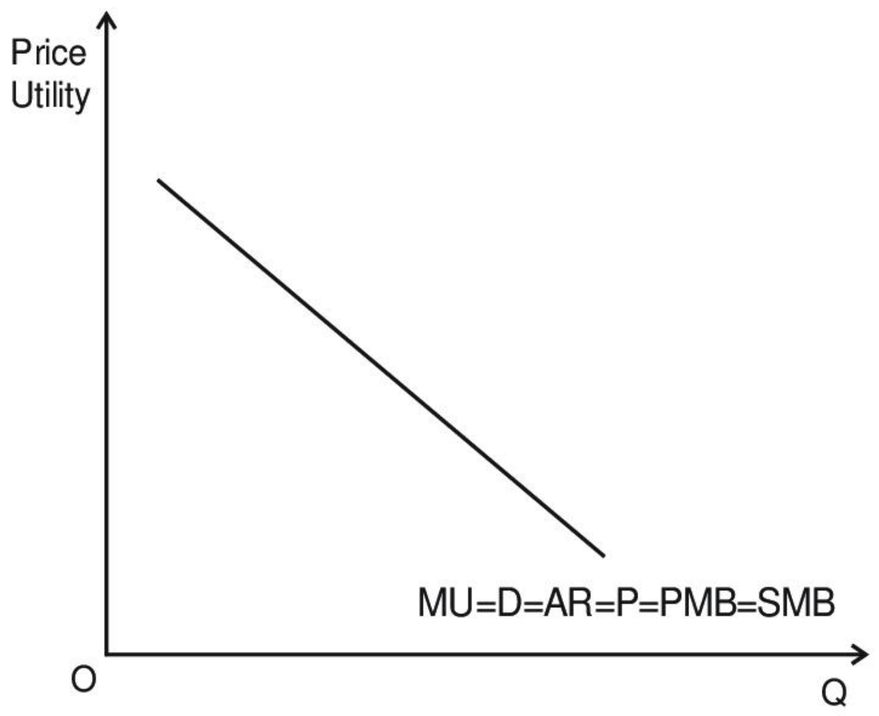
Allocative efficiency is achieved when society allocates its resources to produce those goods and services which are most desirable by consumers in the society.
Allocative efficiency can be judged through various criteria:

- When P = MC, i.e., the value which a consumer puts to an extra unit of a good is equal to the cost involved in the production of that extra unit.
- When there is maximum total surplus (i.e., consumer surplus + producer surplus) and there is no dead weight loss.
- When MSC = MSB, i.e., there is no divergence between private and social costs.

P=MC criterion:

Productive efficiency alone does not ensure the efficient allocation of resources. Least-cost production must be used to provide society with right goods, i.e., the goods that consumers want most.

- The money price of any product is society's measure of the relative worth of an additional unit of that product, e.g., cucumber. So the price of one unit of cucumber is the marginal utility or private benefit derived from that unit of product (PMB). According to law of diminishing marginal utility, marginal utility (MU) diminishes as we consume more so.



Marginal utility curve is a downward sloping curve as average revenue (AR) or demand curve (D). Based on assumption that there is no other market failure, external marginal benefit (EMB) will be zero and social marginal benefit (SMB) will be equal to private marginal benefit (PMB). Therefore:

MU = AR = P = D = PMB = SMB

Hence, price will indicate the benefit of an additional unit to whole society

- Similarly, recalling the idea of opportunity cost, we see the marginal cost (MC) of an additional unit of product measure the value, or the relative worth, of the other goods sacrificed to obtain it. In producing, for example, oranges, resources are drawn away from producing other goods. The marginal cost of producing a unit of oranges measures the society's sacrifice of other goods.
  - According to law of diminishing returns, MC first falls and then rise as shown below:

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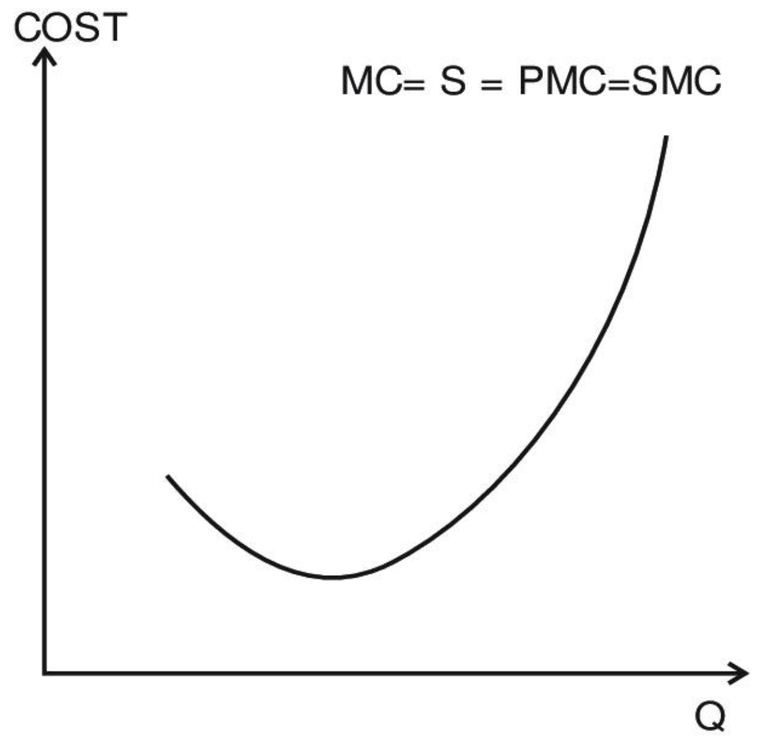
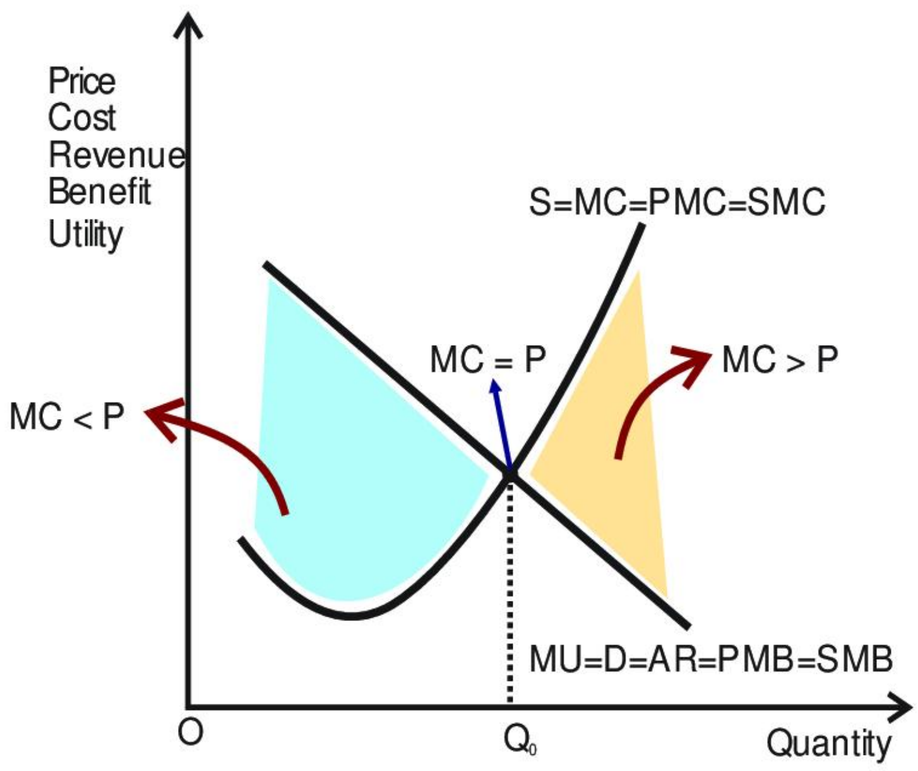


Marginal cost can also be described as cost of one more unit to producers which is also private marginal cost (PMC) and in the absence of negative externalities it also stands for social marginal cost (SMC).

Allocative efficiency is achieved where both curves intersect, as shown.



As long as MU=P > MC, additional unit benefits more as it costs to society and therefore society should increase consumption and production to maximize net social welfare. If MU=P > MC, additional unit costs more than it benefits to society and therefore society should decrease consumption and production to maximize net social welfare. Hence where MU=P=MC is allocative efficient situation.

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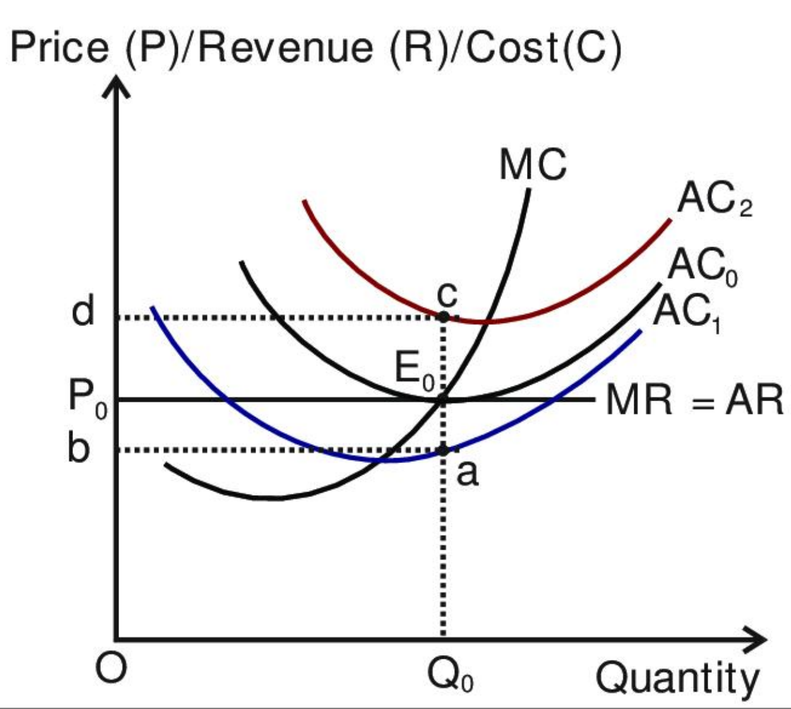
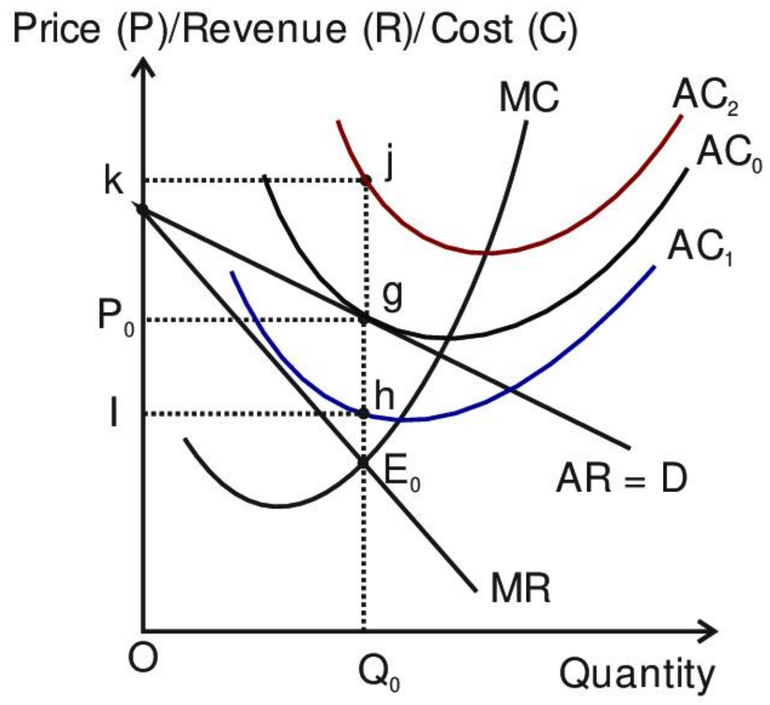
Allocative Efficiency and market structures:

<table>
<tr><th>Perfect competition</th><th>Imperfect Markets
(Monopoly, oligopoly,& monopolistic competition)</th></tr>
<tr><td> 
</td><td> 
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<tr><td>

MC	P=AR	Profits	MC &P	AE
E_0Q_0	OP_0	Normal	$MC = OP_0$	✓
E_0Q_0	OP_0	Abnormal	$MC = OP_0$	✓
E_0Q_0	OP_0	Losses	$MC = OP_0$	✓

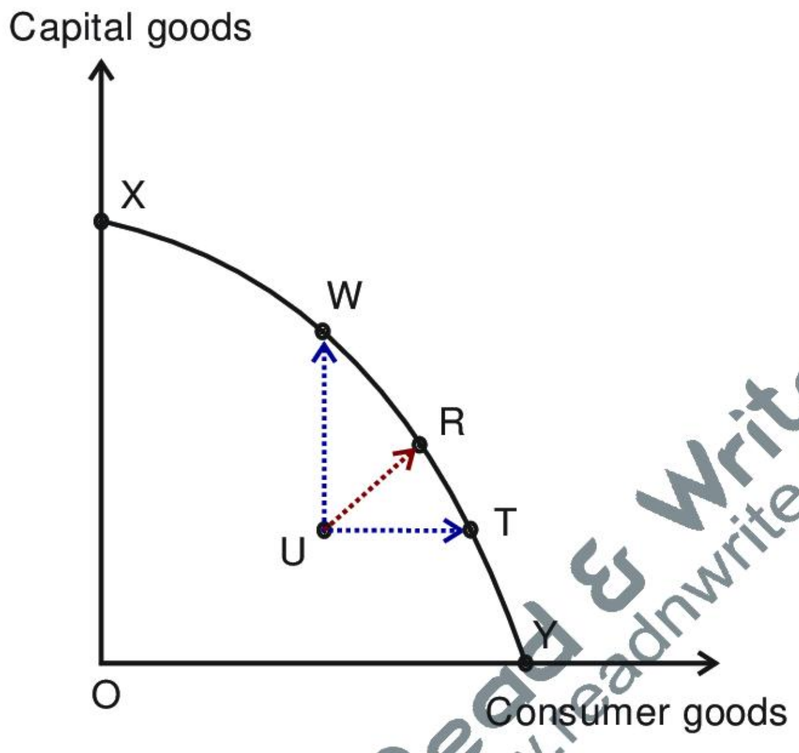
</td><td>

MC	P=AR	Profits	MC &P	PE
E_0Q_0	OP_0	Normal	$MC < OP_0$	×
E_0Q_0	OP_0	Abnormal	$MC < OP_0$	×
E_0Q_0	OP_0	Losses	$MC < OP_0$	×

</td></tr>
<tr><td>Hence, perfect competition is always allocative efficient with all types of profits.</td><td>Hence, profit-maximizing imperfect markets are always allocative inefficient with all types of profits.</td></tr>
</table>

PPC (Production possibility curve) criteria:

PPC is a curve that shows all maximum possible combinations of two goods which a country can produce with all its available resources and efficient technique of production at given state of technology. Let us consider a PPC of a country shown below:



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If a country utilizes all its available resources to produce capital goods and consumer goods, its PPC is shown by a curve joining point X and Y. While productive efficiency can also be defined as a situation where, it is impossible to reallocate resources so as to produce more of some product without producing less of some.

If an economy is producing below its production possibility curve such as point U, it is said to be productively inefficient, because goods are not being produced using the least possible resources. In other words, more of one product can be produced without sacrificing the other.

At points X, W, R,T, and Y, it is not possible, to produce any more of capital goods without sacrificing consumer goods—at least not within the given available resources and technology. Hence, productive efficiency can only exist when an economy is producing right on the boundary of its production possibility curve.

However, the PPC alone is unable to indicate allocative efficiency. A certain point on the PPC will be socially desirable, but it cannot be determined alone with PPC. We will need a social desirability curve which, when it is tangent to the PPC, will determine economic efficiency.
Hence, any point on the PPC is:

Productively efficient	Allocatively efficient	Economically efficient
Yes	Maybe	Maybe

Market Failure:

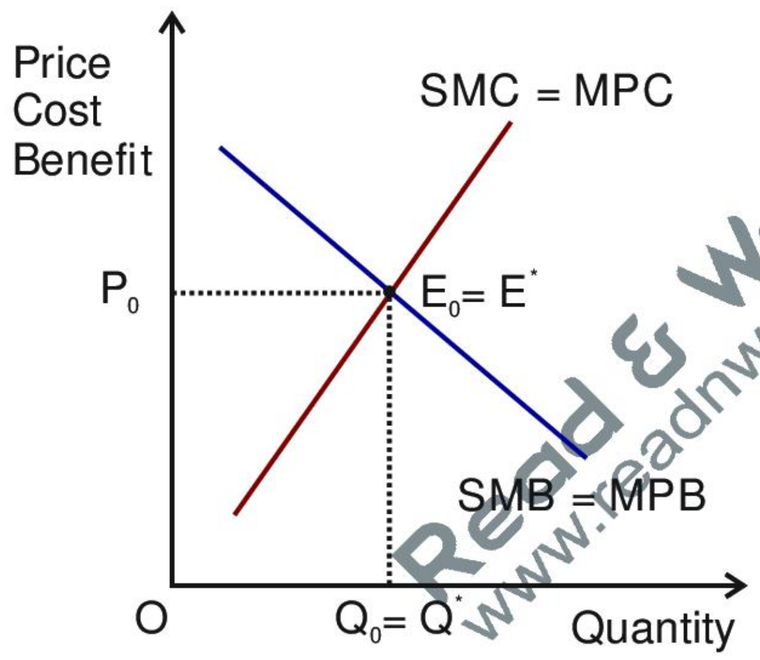
- Market failure is the failure of markets to achieve an optimum resource allocation.
- Inability of market mechanism to reach a point where MSB = MSC

In a market system the price mechanism is used to transmit information from customers to producers. If consumers demand more of a product, the price will rise and in the short run supply will extend. In the long run, supply will increase as new firms, seeing higher profits being made from producing the product, move into the industry. In theory resources should move towards making those products which are increasing in demand.

For this to occur a number of conditions have to be met, producers must be willing and able to respond to changes in demand, there must be no barriers to entry and exit, perfect mobility of factors of production, and costs and prices must reflect social costs and benefits.

For many types of markets, this process works well. In other circumstances though, the market 'fails'. By this we mean that the self-regulating mechanism does not lead to the best allocation of resources. Far from it, the market fails to deliver what is expected. This in turn is the signal for possible intervention.

Under the market economy, resources would be allocated efficiently when there is no divergence between profit maximizing output and socially optimum output. It can be shown by following diagram:



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Presence of externalities (negative or positive) prevents the market mechanism from achieving the socially optimum level of output and is the major cause of market failure even if private firms are opting P = MC policy.

Divergence of MPC from MSC and MPB from MSB is an indication of externalities. Market would fail to allocate resources efficiently because private benefit maximization output would not coincide with socially optimum level of output.

Types of market failure would be:

- Over-allocation of resources (negative externalities and demerit goods)
- Under-allocation of resources (positive externalities, merit goods, and imperfect markets)
- Missing markets (public goods)
- Other market failures

1. Over-allocation of resources:

a) Problem created by negative externalities

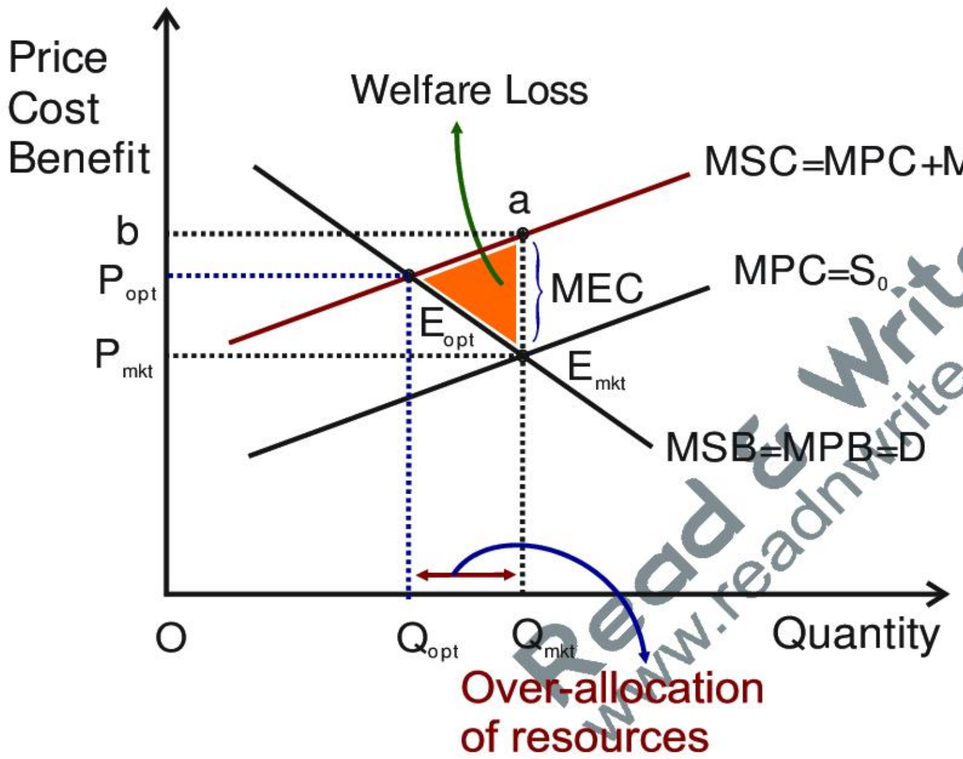
Private costs and private benefits go through the market mechanism and have a price attached to them. Whereas externalities (which can also be called *spillover effects*) do not go through the price mechanism and so do not have a price attached to them. An externality is a cost or benefit to the third parties, i.e., to those not directly involved in the production or consumption of the product. Externalities are the differences between social costs and benefits and private costs and benefits.

Raw-materials, wages, salaries and rent are some examples of costs a chemical making firm will pay and all such costs would be termed 'private'; they have to be paid for by the decision maker (the firm). These costs form part of social costs. However, there are further social costs likely to be involved as well. These might include any dumping of chemical waste, perhaps in the local river, which creates clean-up costs, any atmospheric pollution that creates clean-up costs and ill health, and possible road congestion that result from the transportation of the chemicals. These are negative externalities.

The essence of the problem created by externalities is that they will lead to an inappropriate amount of the product involved being produced; the free market will lead to too much production.

The problem is that only the private costs of producing the chemical will be taken into account by the firm when making the pricing decision about its chemical. The further external costs, which are real costs to society, will not be taken into account. In turn, production will be higher than if full social costs had been considered. Thus, a negative externality will lead to too much of a product being produced.

According to the figure below, profit maximizing output should be at Q_{mkt} where MPC = MPB but socially optimum output is Q_{opt} where MSB = MSC. Therefore, the market mechanism is unable to allocate resources efficiently in the presence of negative externalities.



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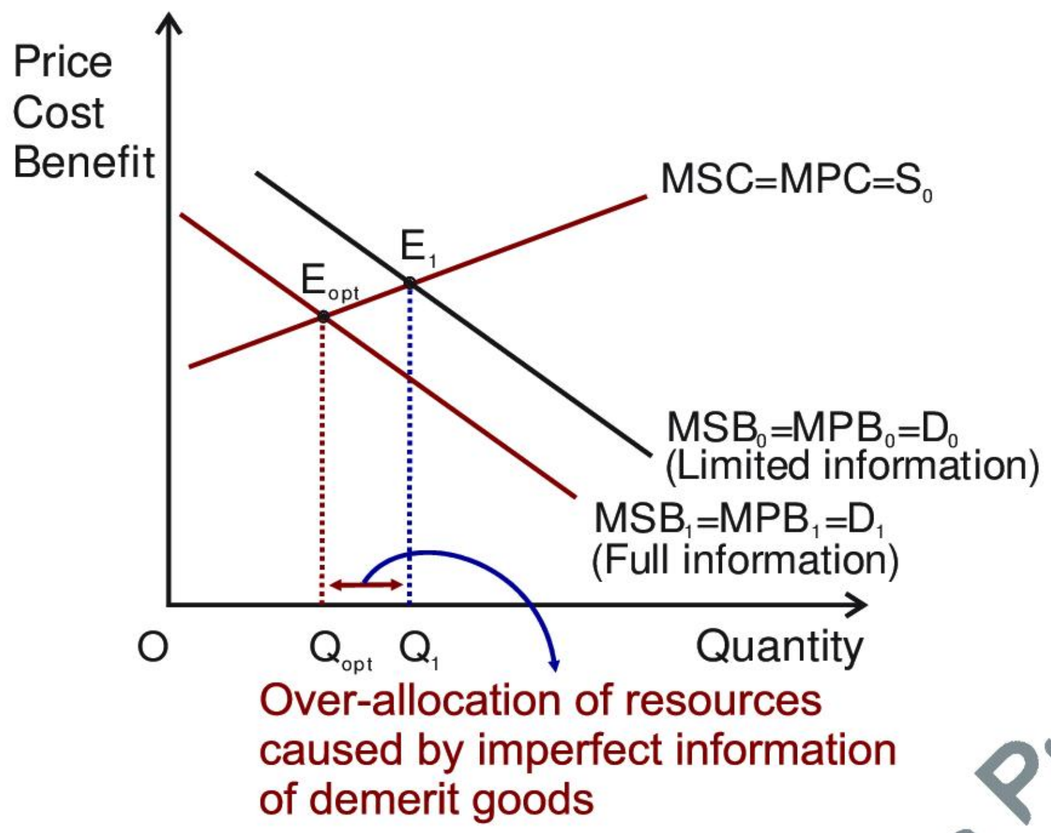
The price that will occur in the market will be P_{mkt}, where the supply schedule that takes account of the private costs, S_0, is equal to demand. This price is associated with production of Q_{mkt}. However, if the supply schedule took into account all of the social costs, S_1, which are just greater than just the private costs, then this would result in the price of P_{opt}. This price is associated with a lower production of Q_{opt}. Thus, the negative externality has led to $Q_{mkt} – Q_{opt}$ too much production. Too many scarce resources are being devoted to the production of this product. The market has failed.

If output is undertaken where MSC exceeds MSB there will be a socially inefficient allocation of resources and, hence, a welfare loss $aE_{opt}E_{mkt}$will result, as shown in the figure above. Welfare loss arises because the value that consumers place on the extra unit of the output at Q_{mkt} is less than the marginal social cost (i.e., what a society has to forgo as a result of producing that unit). Output is too high and a reduction in output to Q_{opt} will increase the welfare of consumers.

b) Problem created by demerit goods

Demerit goods, on the other hand, are those products that are worse for the individual consumer than the individual realizes. Cigarettes are taken to be a typical example here. It is suggested that when a person makes a decision to smoke a cigarette, and he or she is not in full possession of the information regarding its harmful effects (or, as economists say: that there is information asymmetry), then there will be a greater incentive to smoke.

It is interesting to note that the example of a demerit good given here, namely smoking, is the same as the example of the product that can be seen as having negative externalities associated with it. However, the reason for identifying the product is different. Here, it is not due to the damage done to others that causes the issue, but rather the unperceived damage done to the person through consuming the product. This can be explained by the following diagram.



Like cigarettes are a demerit good and their consumption causes negative externalities, there will be two causes of market failure associated with one product and it can be explained by the following diagram:

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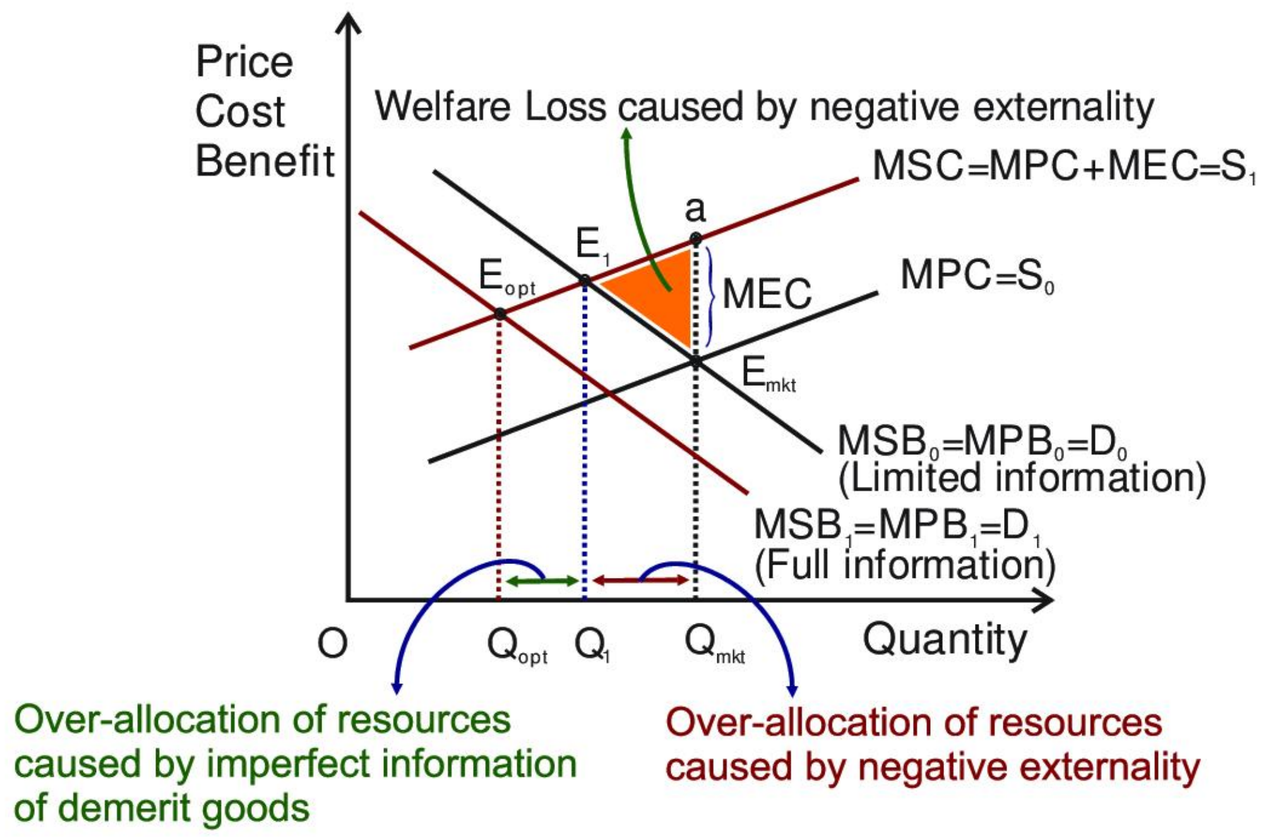
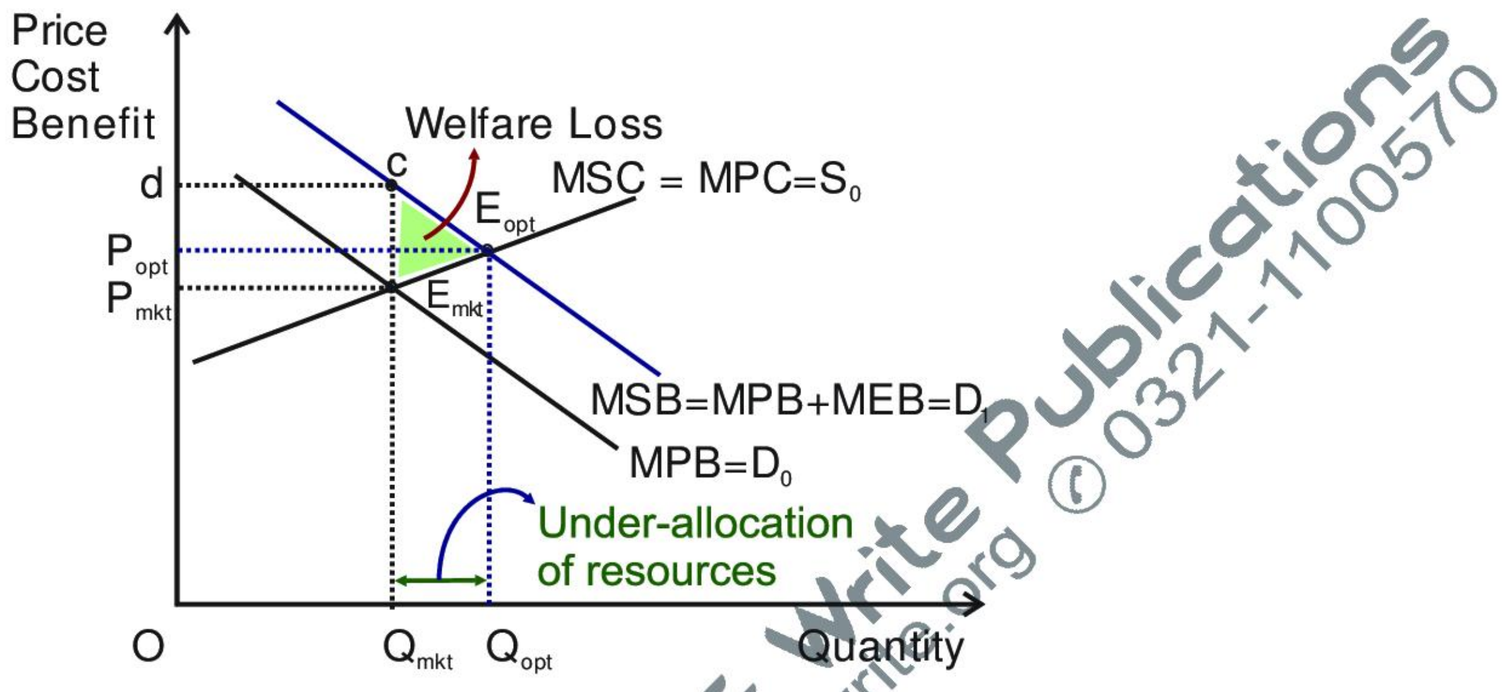


2. Under-allocation of resources:

a) Problem created by Positive Externalities

There can also be benefits to third parties from the consumption and production of others. If someone spends more time and money in their front garden, neighbors may take pleasure in this without paying anything for the enjoyment they derive. Similarly, if a firm spends money in training staff that leave on completion of training, it is rival firms which gain the benefit and which are unlikely to compensate the firm which undertook the training.
Production can also lead to positive externalities. The production of cell-phones in an area, through creating employment, will benefit the shops, places of entertainment etc, in which the workers spend money; whereas the provision of rail service will reduce congestion, accidents and pollution on roads.

In a market economy, only the private benefits, and not the full social benefits, are considered, leading to underproduction. This is illustrated in the following figure:



According to the figure, the profit-maximizing output for a private firm will be where MPB = MPC at OQ_{mkt}, but socially optimum level is beyond OQ_{opt} where MSB = MSC.

This time the problem is with demand. If only the private benefits are registered, then demand is represented by demand schedule D_0. This leads to a price of OP_{mkt}, and associated production of OQ_{mkt}. However, if the further extra benefits to society were registered (which they will not be by the private

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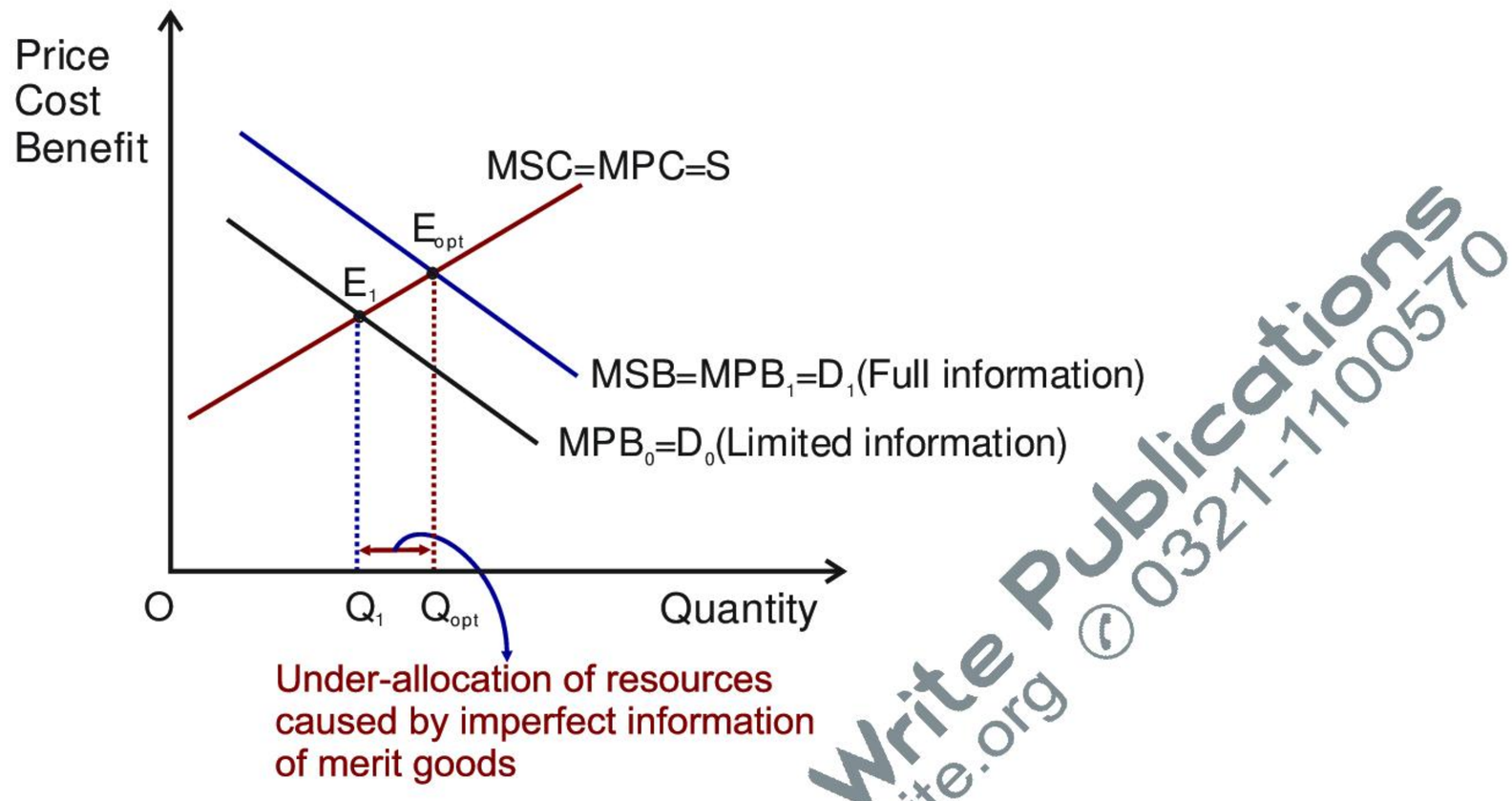
decision maker involved), then demand would be greater at D_1. This would lead to a price of OP_{opt}, and a production of Q_{opt}. Thus, there is an underproduction of $Q_{mkt} - Q_{opt}$ associated with the positive externality. Insufficient scarce resources are being devoted to the production of this good or service. The market has failed.
A welfare loss will also arise as MSB exceeds MSC area $aE_{mkt}E_{opt}$ when output is at OQ_{mkt} as shown in diagram above. In this case consumers value the product more than the marginal social cost of producing the product at OQ_{mkt} .The product is under-produced and society would benefit from an increase in output to OQ_{opt}.

a) Problem created by merit goods:

The state is concerned to increase in consumption of certain goods which it considers to be highly desirable for the welfare of the citizens however consumers do not realize their true private benefits. Such goods are described as merit goods. They are a special form of private goods. The best known examples are state health and education. Other examples include training, insurance, inoculation and seat belts.

In a pure market system, consumer spending on merit goods would be determined by the private benefits derived from them. Merit goods have positive externalities so that the social benefits derived from their consumption exceed the private benefits. In some cases .e.g. seat belts, consumers may fail to recognize their true private benefits.

It is interesting to note that the example of a merit good given here, namely education, is the same as the same as the example of the product that can be seen as having positive externalities associated with it. People undertaking education receives consumption and investment benefits. Most will enjoy the education and it may stimulate lifetime interests (consumption benefit) and will increase their future earning power (investment benefit). In addition to these private benefits, third parties will gain from having a more educated, inventive labour force and a more informed population (positive externalities). However, the reason for identifying the product is different here in case of merit goods. Here, it is not due to the external benefits that it creates, but rather due to the unperceived private benefits to the person through consuming the product.



Like education if a good is merit as well as causes positive externality, there will be two causes of market failure associated with one product and it can be explained by the following diagram:

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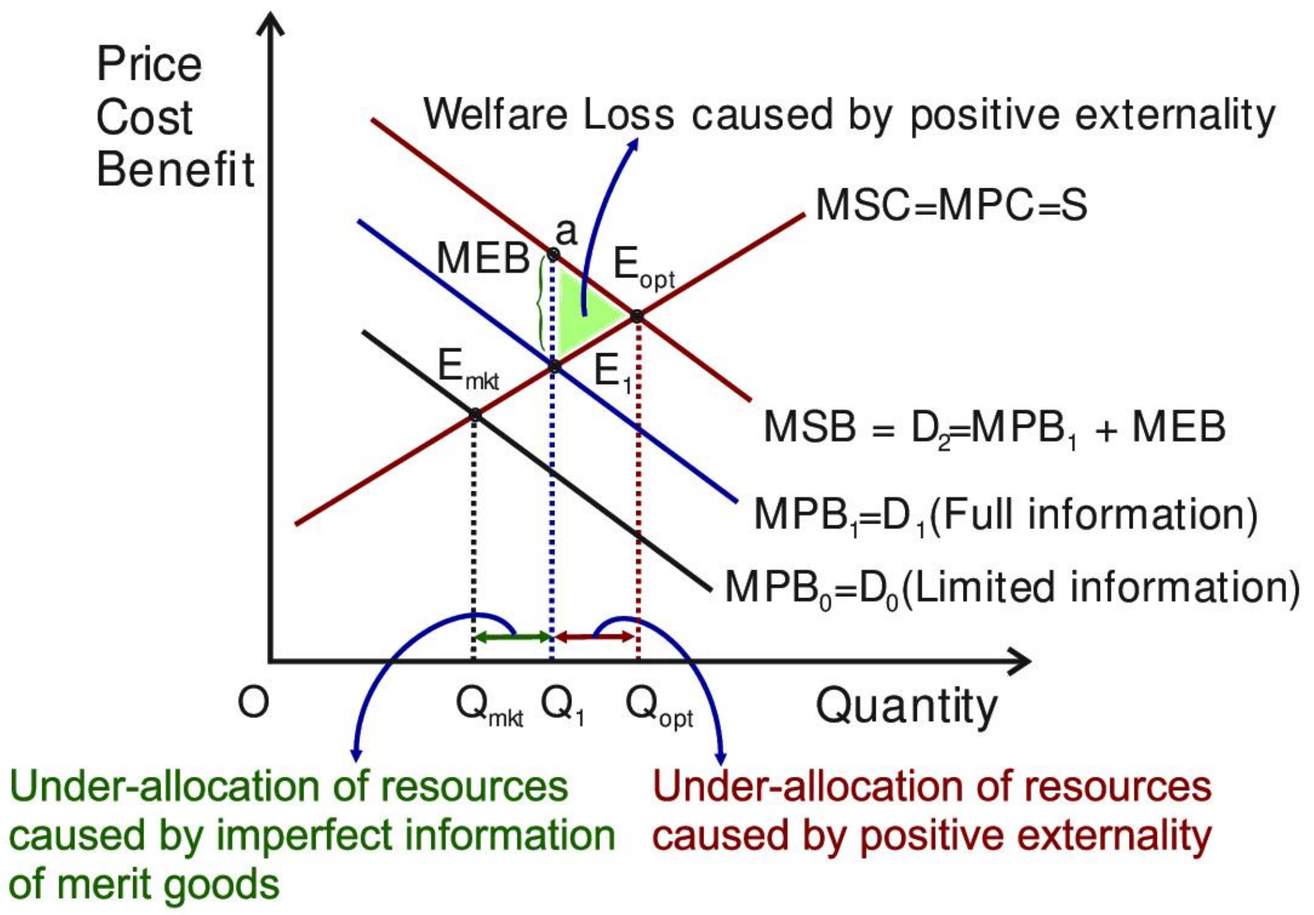
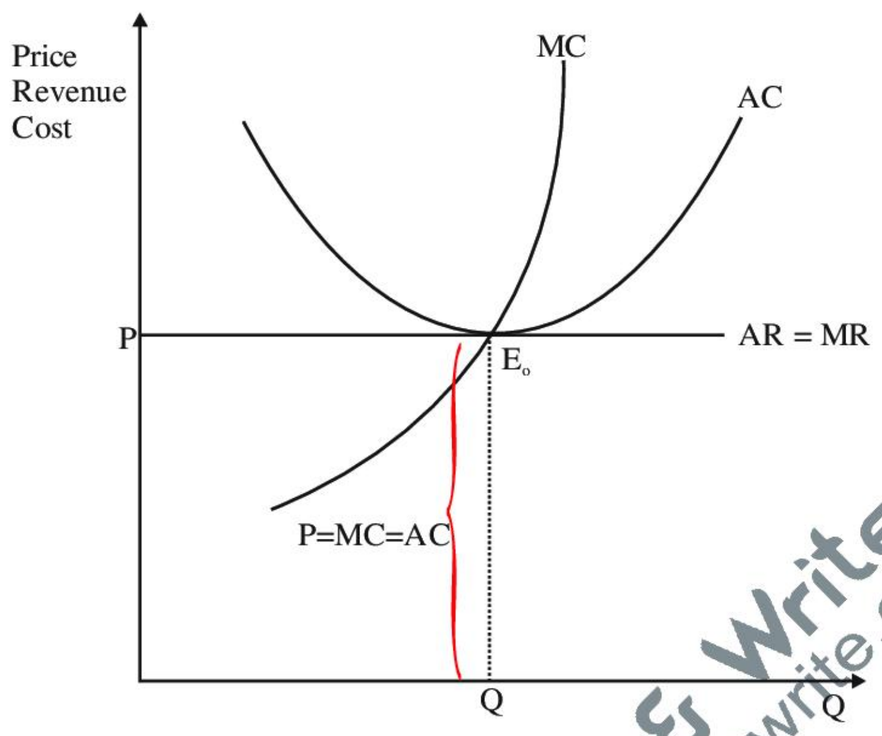


Most economists argue that state intervention is necessary in the case of merit goods to ensure a greater provision of these products than would be supplied under the operation of the price mechanism in free markets.

b) Problem created by imperfect markets

A perfect market—i.e., perfect competition—achieves economic efficiency (i.e., P=MC=AC) without government intervention. In long run, perfect competition forces firms to produce the minimum average total cost of production and to charge a price that is just consistent with that cost. That is highly favorable situation from the consumer's point of view. It means that unless the firms use the best possible (least-cost) production methods and combinations of input, they will not survive. In other words, it means that the minimum amount of resources will be used to produce any particular output. Let's suppose that the output is cucumber:



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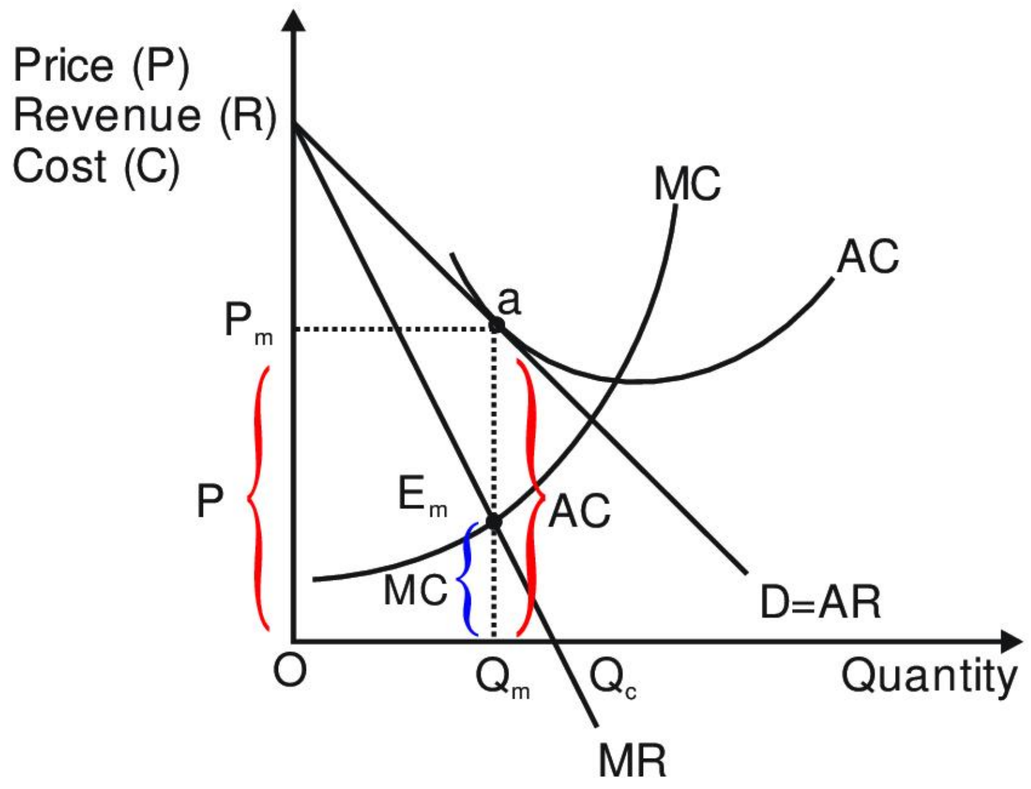
Unfortunately, in the real world, perfect competition does not exist. Whenever markets are imperfect, whether as pure monopoly or some form of imperfect competition, the market will fail to equate MSB and MSC, even if there are no externalities.

Concentrations of economic power refer to institutions that have enough influence to exploit consumers; for example, a monopoly is a market type where there is only one dominant seller who has the freedom to

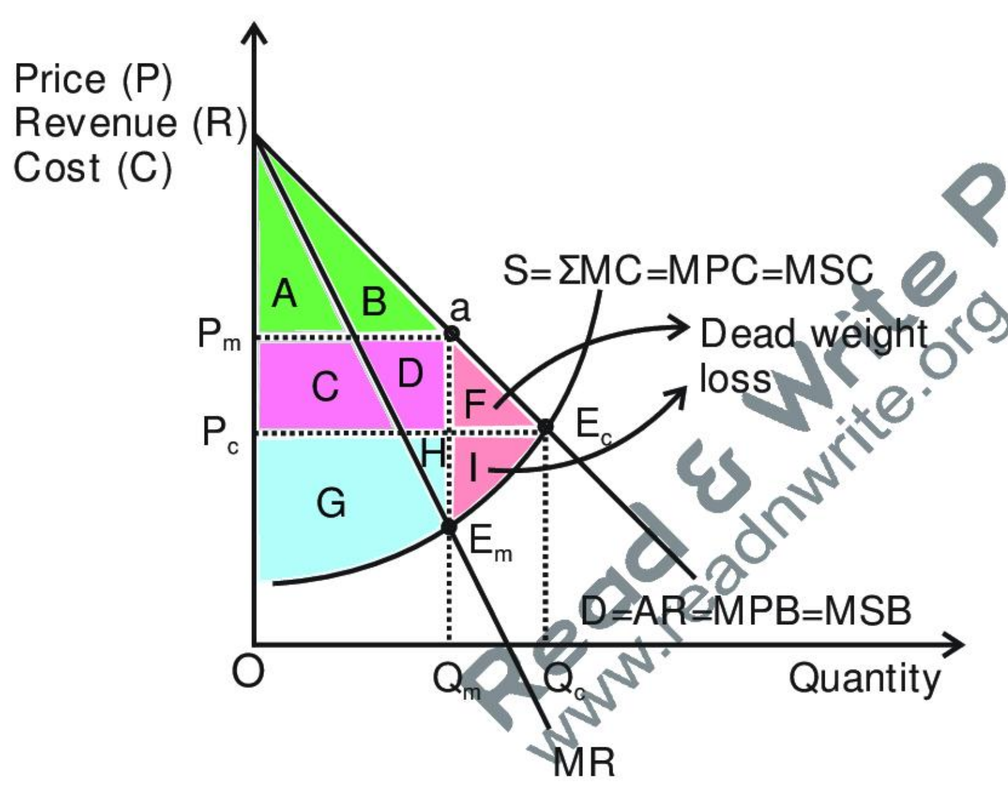
sell its product at a price greater than socially desirable to maximize its own profits. There is under-utilization of resources as the production is carried out at less than the productive efficient point of production. According to the diagram below, productive efficient level is where MC= AC but the monopolist is producing at OQ_m, which is the output that reaps maximum profit, i.e., at MC = MR but AC > MC.



In case of imperfect markets, consumers have to pay the price which is greater than the marginal cost of production. This reduces the consumer welfare. According to the figure, the consumers have to pay the price of OP_m when the marginal cost is E_mQ_m and therefore imperfect markets like monopoly with the objective of profit maximization fails to reach the allocatively efficient point (P =MC).

Economic efficiency of perfect and imperfect markets can also be compared by consumer and producer surplus concepts with presence or absence of dead weight loss criteria.

Take the case of monopoly, a monopoly will produce less than the socially optimum output. This is illustrated in the figure below. A monopoly faces a downward sloping demand curve, and therefore marginal revenue is below average revenue (AR). Profits are maximized where marginal revenue equals marginal cost (at an output of Q_m and price of P_m). But since price is above marginal revenue, price must also be above marginal cost. If there are no externalities and thus P=AR=D=MPB=MSB and MC=S=MPC=MSC, the socially efficient output will be Q_c, where MSB = MSC. Since Q_c is greater than Q_m, the firm is clearly producing less than the socially efficient output.



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Another way of analyzing the welfare loss that occurs under monopoly is to use the concepts of *consumer* and *producer surplus*. Consumer surplus is the excess of consumers' total benefit from consuming a good over their total expenditure on it. Producer surplus is just another name for profit. The two concepts are illustrated in the figure below. The diagram shows an industry which is initially under perfect competition and then becomes a monopoly (but faces the same revenue and cost curves). Let us start by examining producer and consumer surplus under perfect competition and monopoly:

	Perfect competition	**Monopoly**
Equilibrium	D=S	MR=MC
Price	OP_c	OP_m
Quantity	OQ_c	OQ_m
Consumer surplus	ABCDF	AB
Producer surplus	GHI	GHCD
Deadweight loss	–	FI
Consumer surplus converted to producer surplus	–	CD
Economic efficiency	Yes	No

It can be observed from the above figure that the monopolist's output will be where MC=MR, which is output Q_m and the price charged will be P_m. Perfectly competitive industry produces at a point where D=S (as D=AR while S= ΣMC) or AR=MC. Therefore the price charged will be P_c and output will be Q_c. This shows that a monopolist charges consumers a higher price and produces a lower output.

3. Missing Markets of Public Goods:

Nearly all goods are private goods (not to be confused with goods produced in the private sector of the economy). A private good is one where consumption by one person results in the good not being available for consumption by another. For instance, if you eat a sandwich, then your friend cannot eat it; if a firm builds a plant on a piece of land, that land is not available for use by local farmers.
A few goods, however, are public goods. These are goods which possess two characteristics:

Non-rivalry in consumption or **Non-exhaustibility**: consumption of good by one person does not reduce the amount available for consumption by another person.
Non-excludability: once provided, no person can be excluded from benefiting.

There are relatively few examples of pure public goods, although many goods contain a public good element. Clean air is a public good. If you breathe clean air, it does not diminish the ability of others to breathe clean air. Moreover, others cannot prevent you from breathing clean air. Defence is another example. An increase in the population of a country does not lead to a reduction in defence to the existing population. A person in a country cannot be excluded from benefiting even if he or she objects to current defence policy, prefer to see all defence abolished, and refuse to pay to finance defence. Other examples include judiciary and prison services, street lighting, public parks, light house and radio/TV broadcasts etc.

Private Goods	**Public Goods**
Excludable: private goods will be available to those only who qualify for the criteria set to have them, e.g., price, age, gender, etc.	Non-excludable: public goods will be available to everyone and no one can be stopped from their consumption.
Exhaustible/Rival: Availability of private goods diminish to others if someone else consumes them .	Non-exhaustible: availability of public goods do not diminish with their consumption by any number of consumers.
Examples: mobiles and cars (other goods), cigarettes and alcohol (demerit goods), education	Examples; National defence, lighthouses, street lights, police service, national radio broadcast,

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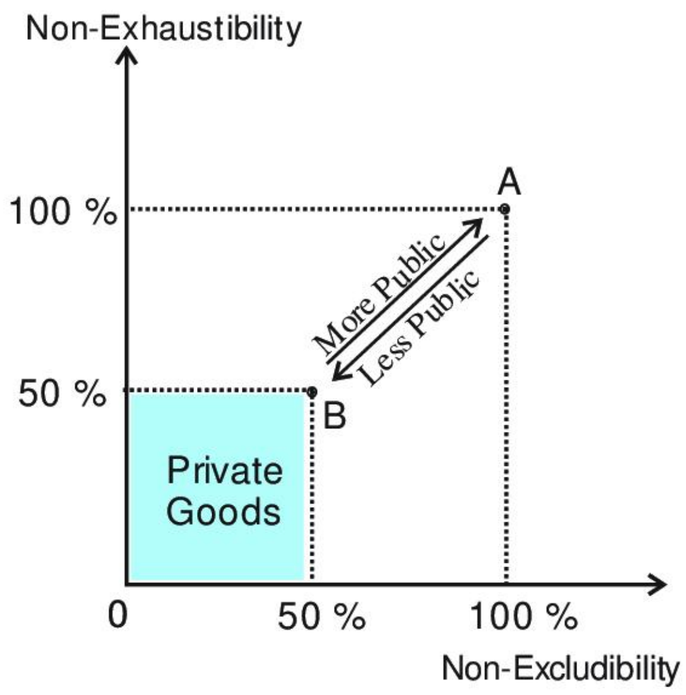
and healthcare etc (merit goods).	etc.
Non-free Rider Problem: nobody can benefit from private good without paying for it; it is sold at a certain price.	Free Rider Problem: people might get benefit of public good without actually paying for it
Marketable: Private goods can be sold in the market	Non-marketable: private sector cannot sell public goods in the market.
Benefit of private goods cannot be extended to others at zero marginal cost	Benefit of public goods can be extended to others at zero marginal cost
Both private and public sector provides them	Only provided by the government: benefit of public goods can be extended to others at zero additional cost (marginal cost).

The provision of pure public goods cannot be left to the market as *non-excludability* makes it impossible to charge for their use. The problem is known as *free riding* (because all consumers automatically benefit from the provision of public goods; they withhold payment hoping to enjoy the benefits of free charge.

However, not all goods are public to same extent. Element of being public varies according to the extent of non-excludibility and non-rivalary present in the product. Some goods are more public than others for example national defence is more public than public parks. This can be explained by the following diagram.



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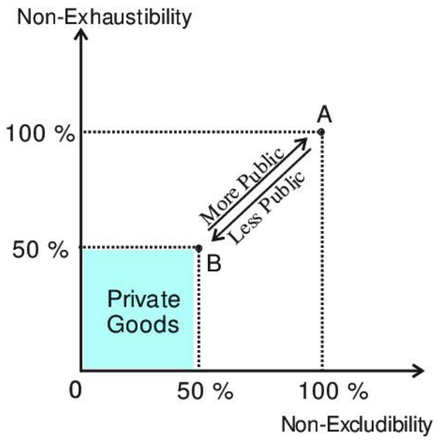
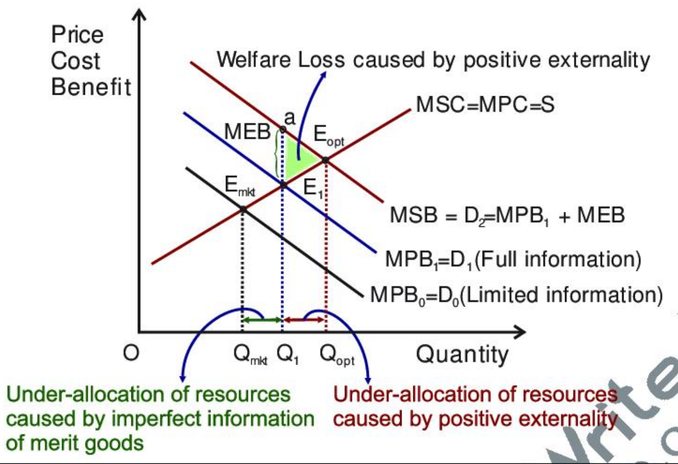
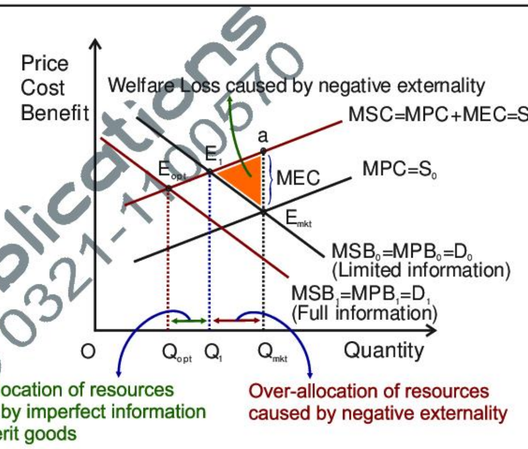
Features	Public Goods	Private Goods	
		Merit Goods	Demerit Goods
Non-excludable	✓	×	×
Non-exhaustible	✓	×	×
Free rider problem	✓	×	×
Non-marketable	✓	×	×
Benefits of public goods can be extended to others at zero additional cost	✓	×	×
Non-rejectable	✓	×	×
Consumers suffer from imperfect information	×	Do not perceive actual private benefit	Do not perceive actual private cost
Production & consumption in market economy	×	Under-consumption	Over-consumption
Examples:	National defence, lighthouses, national T.V., and radio broad casts.	Education, healthcare, vaccinations, seat belts, helmets, etc.	Cigarettes, alcohol, drugs, etc.
May create externalities			

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4. Imperfect knowledge

We said earlier that the only truly efficient market structure is perfect competition. One of the key assumptions with this market structure is that all buyers and sellers have perfect information. In the real world, this obviously does not happen.

a. Imperfect information to consumers

Lack of information is probably the most apparent cause of market failure to consumers. We have all, no doubt, experienced frustration from our less than perfect knowledge of the prices on offer, the qualities and range of commodities on offer and our weakness in resisting persuasive advertising.

b. Imperfect information to labour

As workers we also are forced to make decisions based on incomplete information regarding, for example, the wage rates on offer in an area, the jobs available in other areas, or even other countries, and the career prospects in rival firms. When it comes to the decisions to invest in human capital (i.e., in education and training), the problems become even more acute. How are we to know our aptitude for a particular career? What exactly are the best qualifications? How are we to know how future economic changes will affect the prospects from various careers?

c. Imperfect information to producers

Producers also face similar information problems concerning available supply prices for labour, raw-materials and capital. They too face uncertainty when it comes to deciding to investment projects, e.g.,a given restaurant may be half empty one evening and then have queues down the street the next. Ideally, they would like to be able to adjust their prices to allow for this, but they do not have the information beforehand to be able to do this

5. Factor immobility

"Factor" here refers to **factors of production**. In particular, we mean the immobility of land, labour, and capital. Obviously land is immobile, but in this context we mean whether it is easy or difficult to transfer the factor in question to another use.

'Capital' generally is fairly mobile nowadays, especially between countries as old restrictions have been eliminated. But once money has been invested in a certain type of capital, like a nuclear reactor, how easy is it to transfer that capital to another use?

The biggest problem in most countries is the lack of labor mobility in terms **occupational mobility** (ability to move between the occupations) and **geographical mobility** (ability to move between the areas).

6. Short termism

Private sector entrepreneurs are often criticized for perusing short term objectives at the expense of long-term planning. Short-termism can result in the over production of consumer goods, the under production f capital goods and a failure to develop new methods of production and new products.

Government Microeconomic Objectives:

It is possible to identify two possible economic justifications for the government to intervene in the operation of free markets.

Efficiency

Government may intervene in markets in order to try to restore economic efficiency. If markets are seen to be failing, for the sorts of reasons indicated in the first part of the section, then the government may try to move the market to a more efficient position through the use of various policies. Both productive and allocative efficiency could be improved through the introduction of appropriate government policies.

Equity

A further concern over the operation of free markets is to do with equity. Even if markets may be judged to be efficient, they may not be judged to be equitable.

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Equity has to do with fairness. The outcome of the free market may be judged to be unfair. This can be seen in comparison that is sometimes used between so called 'political democracy' and 'economic democracy'. A free market is sometimes likened to an economic democracy. Consumers are the voters and money represents the votes. Those products that are 'elected' are those that receive most money votes. Thus, free markets produce allocative efficiency as they ensure that those products most in demand are those that are produced. There is, however, one important difference between these two democracies. The underlying principle of the political democracy is that of 'one-person-one-vote'. This is clearly not true of the economic democracy. Here, the number of votes varies greatly between individuals. Some have very few, if any, while others have very large number of votes. Some may judge it to inequitable and undesirable aspect of the market economies.

This area of economics is not without difficulty. One person's judgment of what may be 'equitable' is not necessarily the same as another person's view. This is 'normative' economics: there are clear value judgments to be made between what is 'right' and 'wrong'. The role of the economist is usually seen as identifying the inequality and allowing others (such as politicians) to judge its desirability.

Policies to correct market failure of negative externalities and demerit goods

- Indirect taxes
- Laws and regulation
- Regulatory bodies
- Provision of information
- Extending property rights
- Pollution permits

There are several policy instruments that the government can use. At one extreme it can totally replace the market by providing goods and services itself. At the other extreme it can merely seek to persuade producers, consumers, and workers to act differently. Between the two extremes the government has number of instruments it can use to change the way markets operate. These include taxes, subsidies, laws, and regulatory bodies.

1. Indirect Taxes

The rule here is simple: the government should impose a tax equal to the marginal external cost (or grant a subsidy equal to marginal external benefit). Assume, for example, that a chemical work emits smoke from a chimney and thus pollutes the atmosphere. This creates external costs for the people who breathe in the smoke. The marginal social cost of producing the chemicals thus exceeds the marginal private cost to the firm (MSC > MPC).

To deal with negative externalities, indirect taxes (compulsory transfer of money from the private to public sector) will be used and for positive externalities, subsidies (grant given by government to firms to increase their production) will be used.

By using indirect taxes to correct negative externalities, the rule is to impose a tax equal to the marginal external cost. This would shift the supply curve (S) towards the left (S_1) to the optimal position reflecting the social costs as shown in the diagram below.

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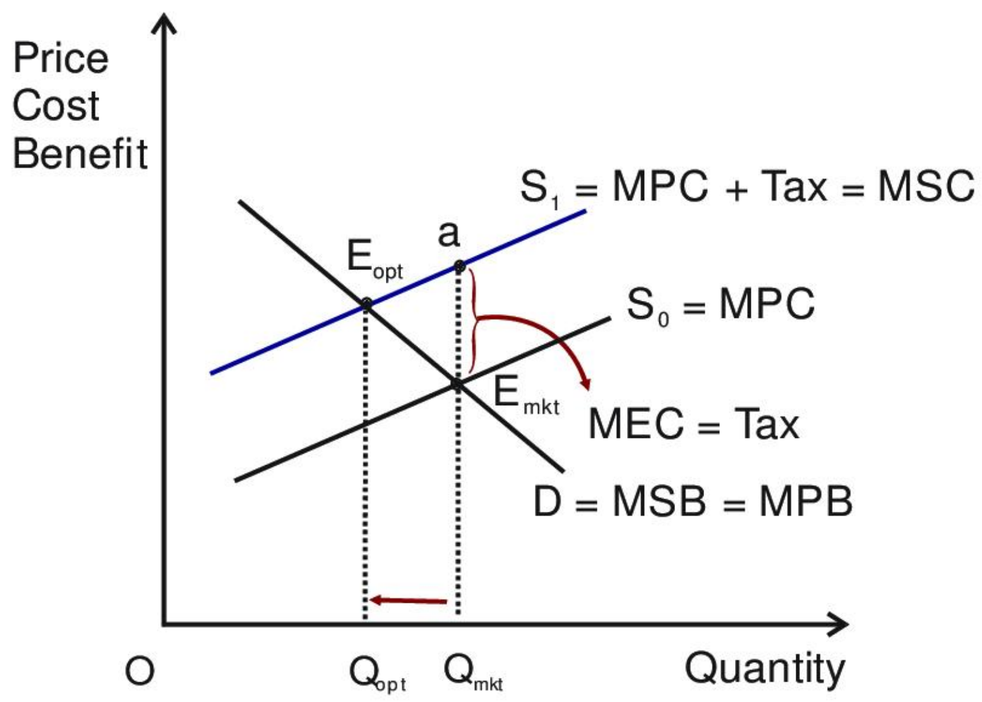

This would effectively internalize the externality as the firm will have to pay amount equal to its external cost it creates. Thus, profit maximization will occur where marginal social benefit (MSB) equals marginal social cost (MSC).

Advantages:

- It still allows the **market to operate**
- It forces firms to take on board the full social costs and benefits of their actions and **internalize the externalities.**
- Use of indirect tax acts as incentive to reduce pollution in future and invest in **green technology** (environment friendly technology) as lower pollution emissions means lower private cost of taxes to firms.
- Tax can be used with **flexibility**—a higher tax on firms producing more pollution makes it a preferred measure to correct market failure of negative externalities.
- **Tax revenue** collected can be used to finance merit and public goods and compensate the society to an extent.

Disadvantages:

- Efficient tax should be equal to **MEC which can't be measured** accurately and expressed exactly in monetary terms. Therefore, there are possibilities of over-taxation or of under-taxation, leading to a failure of government policy.
- Most indirect taxes are **regressive** in nature and therefore increase the disparity between the rich and the poor.
- Indirect taxes are also **inflationary**, as they add to the cost of production and lead to cost-push inflation.
- Goods having **inelastic demand**, especially demerit goods, will not be strongly influenced, even by high taxes.
- Indirect taxes create **dead weight loss** to society.
- If every firm is charged differently according to its MEC, it will be almost impossible to monitor all firms' individual acts of polluting. An army of tax inspectors would be necessary to inspect the system.

Finally, we can conclude that taxes have the ability to tackle negative externalities and demerit goods, but these measures have their drawbacks which hinder a socially optimum allocation of resources.

2. Laws and Regulation

Regulation is a method used throughout the world to control externalities. The government could lay down **maximum pollution levels** or might even ban pollution-creating activities altogether. Government may impose limits on the harmful emissions from car exhausts or it may ban the burning of ordinary coal

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in urban areas. Apart from control of negative externalities, there could be a **complete ban** of some products.

Advantages:

1. They are usually **simple** and clear to understand and are often relatively easy to administer. For example, various polluting activities could be banned or restricted.
2. When the **danger is very great**, or when the extent of the danger is not as yet known, it might be much safer to ban certain activities and practices altogether (e.g., the use of various toxic chemicals or the consumption of heroin) rather than relying on taxes.
3. When the decision needs to be taken **quickly**, it might be possible to invoke emergency action.
4. As **consumers suffer from imperfect information**, consumer protection laws can make it legal for firms to sell substandard or unsafe goods, or to make false or misleading claims about their products.
5. Effective even with **inelastic demand**.
6. It is **fairer than taxes**. For example, people with high incomes may be willing to just pay more to drink and drive.

Disadvantages

1. No **tax revenue**
2. **No incentive to reduce pollution** below the allowed limits.
3. Subject to corruption of law when forcing authorities in less developed countries.
4. It may be socially inefficient to ban everything; e.g., you could ban cars in city centers—this would reduce pollution but could have adverse economic effects on business.
5. Prohibition can encourage the underground economy and give more economic power to criminal gangs who trade in drugs. Also, if drugs are illegal, they may be more likely to be poor quality.

3. Regulatory bodies

Rather than using the blunt weapon of general legislation to ban or restrict various activities, a more subtle approach can be adopted. This involves the use of various regulatory bodies. Having identified possible cases where action might be required (e.g., potential cases of pollution, misleading information, or the abuse of monopoly power), the regulatory body would probably conduct an **investigation** and then prepare a report containing its findings and recommendations. It might also have the power to enforce its decisions.

4. Changes in property rights

- **Private Property** is owned by an individual or group of individual, e.g., house.
- **Public property** is owned by whole society, e.g., Air, parks open spaces, libraries, historic buildings, etc.
- **Private property right** means the right to sue the person in court for compensation of damage caused by culprit to one's private property.
- Government extends this private property right to the share of public property every one owns in the society. By **extending these rights**, individuals may be able to prevent other people imposing costs on them, or charge them from doing so.

However,

- it is hard to identify the actual culprit in most of cases specially if culprits are many
- Justice may not be free, and there is thus a conflict on equity. The rich can afford better justice.

5. Provision of Information

Government may inform the public about the potential harmful effects of demerit goods and negative externalities through different media for example warning messages on packing of demerit goods like cigarettes.

Advantage: Better informed population will reduce consumption and production of such goods.

Disadvantage: People might ignore such warnings and even increase their consumption due to ‘danger appeal’.

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6. Pollution Permits

A variation of regulating pollution through direct controls is the idea of pollution permits. Here, the government sets a limit on the amount of pollution permitted. The government then allocates permits to individual firms and other polluters. These permits can then be traded for money between polluters. For instance, one electricity generating company might have relatively modern power plants which in total let out fewer emission then its permits allows. It could then sell surplus permits to another electricity company which had older plants which, if allowed to run, would exceed its permits given by the government.

Advantages:

- Government can limit pollution to any desirable level.
- Incentive to reduce pollution

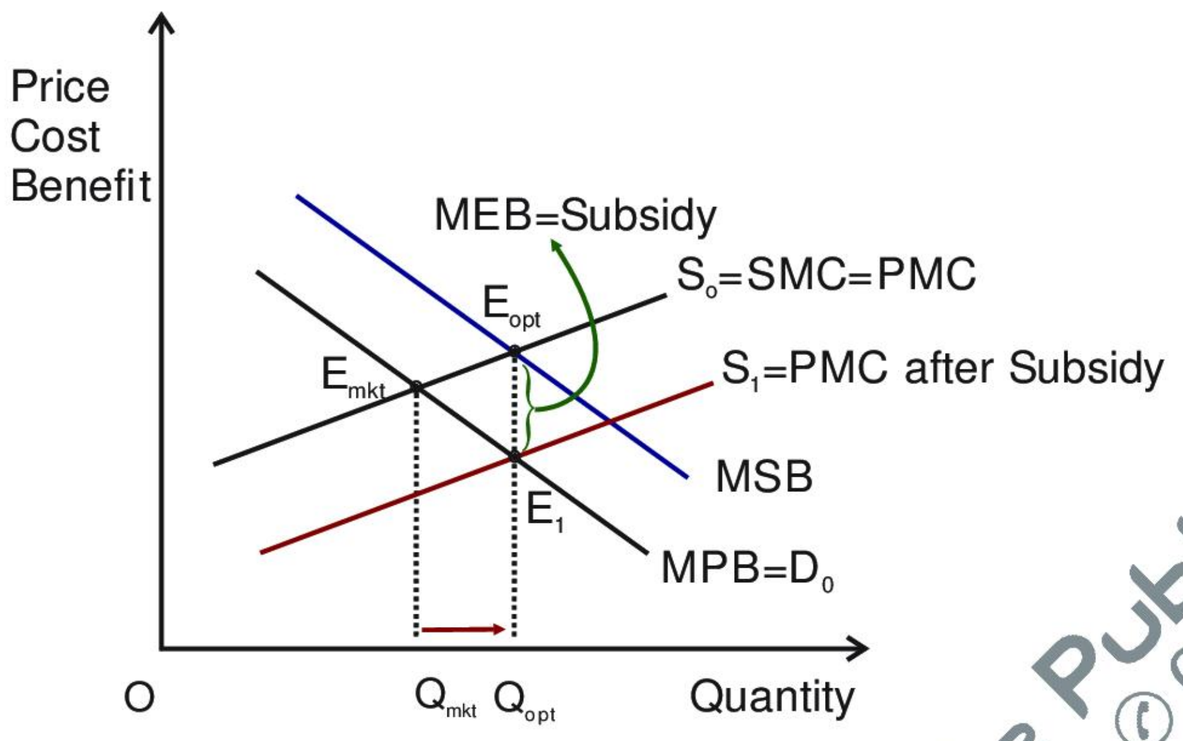
Disadvantages:

- Not easy to monitor the levels of pollution created by each firm. There is potential for hiding pollution levels.
- Administration costs of implementing the scheme.
- It is difficult to know how many permits to give out. The government may be too generous or too tight.

Policies to correct market failure of positive externalities and merit goods

1. Subsidies

When subsidies are used to correct positive externalities, the rule is to grant a subsidy equal to the marginal external benefit (MEB). This would shift the supply curve towards the right from S_0 to S_1 to the socially optimum level of production, as shown in the diagram below:



Advantages:

- It still allows the **market to operate**.
- It forces firms to take on board the full social benefits of their actions and **internalize the externalities**.
- Use of subsidy acts as incentive to increase spending on environment friendly projects and merit goods.
- Subsidies can be used with **flexibility**—subsidies can be increased to firms producing commodities that benefit the economy with positive externalities, make it a preferred measure to correct market failure caused by a lack of merit goods.

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Disadvantages:

- Efficient subsidy should be equal to **MEB which can't be measured** accurately and expressed exactly in monetary terms. Therefore there are possibilities of over-subsidization or of under-subsidization leading to a failure of government policy.
- Mostly subsidies are **regressive** in nature and therefore increase disparity between rich and poor.
- Subsidies are also **deflationary** as they cut the cost of production and lead to deflation.
- Goods having **inelastic demand** will not be influenced strongly even with high subsidies.
- Subsidy will create **dead weight loss** to society.
- There is a danger that government subsidies may encourage **firms to be inefficient** and they come to rely on subsidy rather than improve efficiency.

Finally, we can conclude that subsidies have the ability to tackle positive externalities and merit goods, but these measures have their drawbacks which hinder a socially optimum allocation of resources.

2. Laws and Regulation

Either compulsory production (e.g., public toilets) and consumption (e.g., health insurance) or a minimum level of production (e.g., parking space) and consumption (e.g., education).

Advantages

- Easy and quick to implement.
- Effective even if demand is inelastic

Disadvantages

- Not flexible
- Less effectives in countries with poor law and order.

3. Provision of Information

Government may inform the public about the true benefits of merit goods and positive externalities through different media.

Advantage: Better informed population will increase consumption and production of such goods.

Disadvantage: People might ignore such messages and persuasions.

4. The Direct Provision of Goods and Services

The government can also provide goods and services directly to correct the market failure of under-allocation of resources or missing markets of public goods.

Direct provision is desirable:

1. **Public goods** are non-excludible (no one can be stopped from consumption) and non-exhaustible (consumption by one person does not reduces availability of the good to others). Therefore, they are not supplied by market mechanism, for example street lights and national defense; the government needs to supply them directly.
2. **Merit goods** are those goods whose actual private benefit is not realized by the consumers who consume them, for example education and healthcare. The government makes the right judgments and encourages the private sector to increase production by subsidies, provision of information, laws and regulation etc. However, if despite all above measures, the private sector is unable to supply such goods to the socially optimum point, the government needs to supply them directly, even at zero price.
3. Another case is when there is existence of **positive externalities**. Positive externality is the benefit gained by the third parties. Goods with positive externalities will be produced less than the socially optimum quantity; they will be under produced so there is a need for government direct provision.
4. There is also the case of **mega-projects** that require huge finance, like building railway networks, water dam, etc. The private sector may not be able to finance them, so the government needs to intervene.
5. Government also set up industries and produce directly in order to **create employment** especially labour intensive projects

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6. **Security** can also be an issue; for example, airports cannot be left to private hands for security reasons.
7. Projects that become **beneficial after decades** of setting up (such as research and development) are undesirable by the private sector, so the government provides them directly.
8. Some industries may be **natural monopolies** and the private sector may exploit consumers. Government prefers to keep such industries under its own control so it can ensure the availability of essential goods and services at lower prices to general public. Examples of such goods include water, sanitation, electric distribution, railway network, etc.

Direct provision is not desirable because:

- More burden of tax on tax payers
- Low quality
- Inefficient
- Corruption
- Shortages and surpluses

Hence, although the market mechanism provides consumer sovereignty, it is important for government to intervene when the market fails or ownership of some specific industries is not appropriate in the private hands.

Policies to correct market failure of public goods

With a pure public good, once it is provided the marginal cost of supplying one more consumer is zero. Take the case of a lighthouse. Once it is constructed and in operation, there is no extra cost of providing the service to additional passing ships. Even if it were possible to charge ships each time they make use of it, it would not be socially desirable. Assuming no external costs, MSC is zero. Thus MSC = MSB at a price of zero. Zero is, thus, the socially efficient price. Therefore, the only policy option government may have to correct the market failure of public goods is direct provision

Policies to correct the market failure of imperfect markets

Government regulation may be used in order to control the behavior of monopolies. There are several forms of regulation that can be used for this.

1. **Legislation that outlaws the formation of monopolies:** This is usually referred to as **merger policy**. It takes the view that the formation of a monopoly in a market may be undesirable, and thus, under some circumstances, mergers that would create a monopoly would not be allowed to occur.

2. **Legislation that forbids certain types of monopoly behavior:** An example might be '**predatory pricing**'. This is the practice of a powerful producer deliberately setting its price below the cost of production. It does this in order to try to destroy competition. Either a current firm is to be driven out of business or a potential new firm is dissuaded from entering the market.
3. **Laws that insist on certain standards of provision:** These try to ensure that there is a guaranteed quality of the product provided in monopoly markets.

4. **Enforcing marginal cost pricing in an industry:** If the government forces a monopoly firm to adopt marginal cost pricing, it will be allocatively efficient, as shown in the diagram below:

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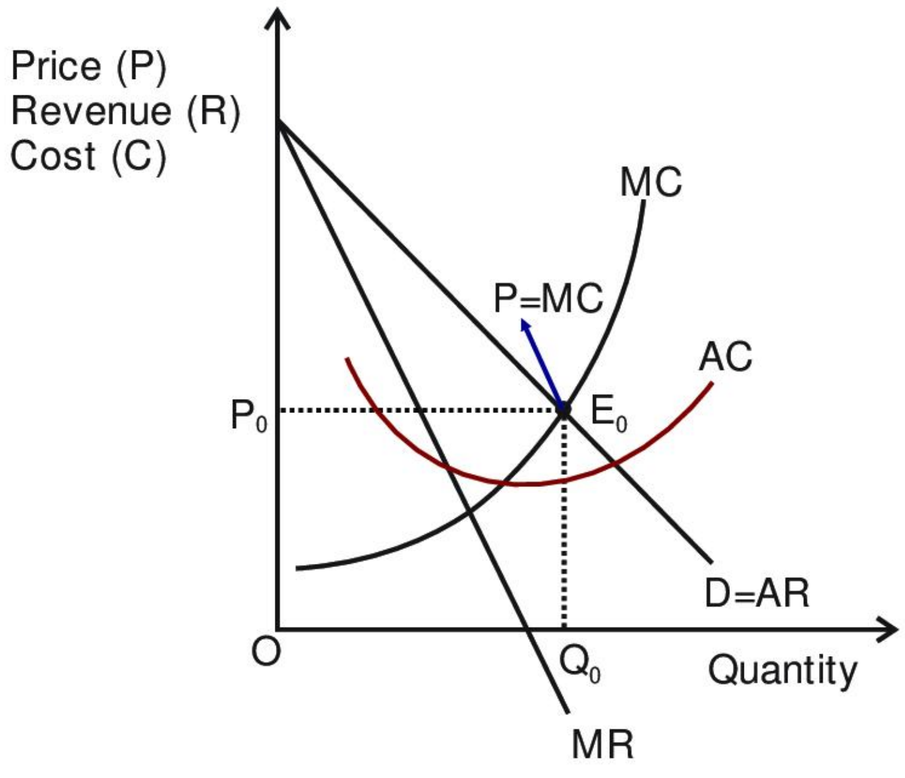

Cost-benefit Analysis (CBA):

Cost-benefit analysis is a method of analyzing the net social benefit of any major project. It helps government to compare net social benefit of various projects and encourage government to take the best decision with the aim of collective social welfare.

Cost-benefit analysis can be conducted in four major steps. Let us start with an example of airport construction.

- First of all, **all the costs and benefits are identified**. In the case of an airport, costs include: the cost of raw material needed for construction, wages, land, and also the external cost of airport construction which includes noise pollution, the fall in value of nearby land, traffic congestion, less development in the area, etc. After identifying social costs, the government will deduce private and external benefit of the project. Private benefit will include landing charges to CAA, canteen profit, and parking charges, while the external benefit will be gains in the form of employment, the availability of infrastructure like electricity, drainage, and water, etc.
- After identifying the present cost, the government will **predict future costs and benefits** which, in this case, may include costs of the extension of the runway, noise and air pollution, traffic congestion on nearby turns, and anxiety due to noise, and the benefits might include the construction of improved infrastructure, construction of nearby industries, easy cargo, increase in an international trade, construction of diversified roads, etc.
- After identifying all costs, the government allocates a **monetary value to all costs and benefits**. Private costs and benefits can be easily quantified, but the problem arises for external costs and benefits, which do not have any fixed tangible value. To solve this problem economists use shadow pricing. The government calculates the cost of cleaning up that negative externality and as a quantified, monetary value; e.g., if a body of water is polluted, then the cost to clean all the pollution in that water is the cost of that externality, and this is taken as the monetary value.

- After assigning values, the government **makes the decision** based on the aim of social welfare. If the social benefit is greater than the social cost, the government will approve the project. The difference here shows the net benefit to society, and if the benefit exceeds the costs, then it might be beneficial for an economy; but the government will also compare the net social benefit of a current project with all other alternatives available, and will choose the project with the highest net social benefit.

However,

- There may be **problems in attaching monetary valuations to costs and benefits**: Some costs are easy to value, such as running costs (e.g., staff costs) + capital costs (new equipment). Other costs are more difficult—not least when a project has a significant impact on the environment. The value attached to the destruction of a habitat is, to some, “priceless,” and to others, “worthless”.
- Costs are subject to change over time.

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- **The CBA may not cover everyone affected** (i.e., all third parties)—inevitably, with major construction projects, such as a new airport or a new road, there are a huge number of potential "stakeholders" who stand to be affected (positively or negatively) by the decision. A CBA cannot hope to include all stakeholders—there is a risk that some groups might be left out of the decision process
- Costs and benefits mean different things to different income groups—benefits to the poor are usually worth more (or are they?). **Those receiving benefits and those burdened with the costs of a project may not be the same**. To many economists, the equity issue is as important as the efficiency argument.
- **Valuing the environment is another issue**. How are we to place a value on the environment, where there is no market established for the valuation of "property rights" over environmental resources? How does one value "nuisance" and "aesthetic values"?

Despite these problems, most economists argue that a CBA is better than other ways of including the environment in a project appraisal.

Are Monopolies Always Bad for Consumers?

Disadvantages of a monopoly

1. **Unwelcome concentration of economic power**
   - Monopolists usually charge higher prices than other market structures.
   - The monopolist increases its output only if there is an increase in demand, causing it to only increase quantity supplied slightly, pushing prices up.
   - Monopolists may also destroy goods to reduce supply.
2. **Inequality of income**
   A monopoly causes greater inequality of income, since monopolists can earn supernormal profit both in the short and long runs, causing their incomes to rise. In perfect competition there is less inequality because producers can only earn normal profits in the long run.
3. **No consumer sovereignty**
   The consumers are powerless and have to accept whatever goods and services are produced by the monopolist.

4. **Absence of competition**
   Since there are no rivals, there is no competition, causing a fall in both the quantity and the quality of the goods in the market. The lack of competition would also mean that there is no incentive for existing firms to increase efficiency or invest in research and development. Monopolies usually carry out their operations by traditional and conventional methods, of which Pakistan railways is a good example.

5. **Productively inefficient**
   There is an under-utilization of resources as production is carried out at a point below the productively efficient level. According to the diagram below, the productively efficient level of output is that for which MC= AC, but the monopolist is producing Q_m, which is profit-maximizing output. At the profit-maximizing level of output, MC = MR, but AC > MC.

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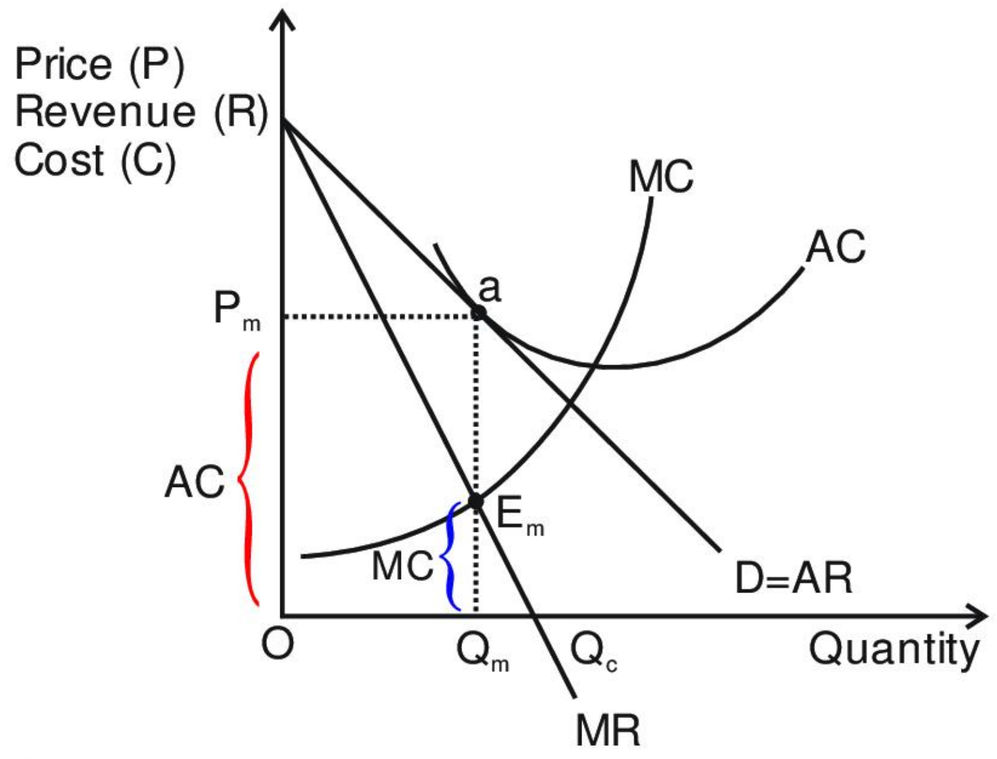
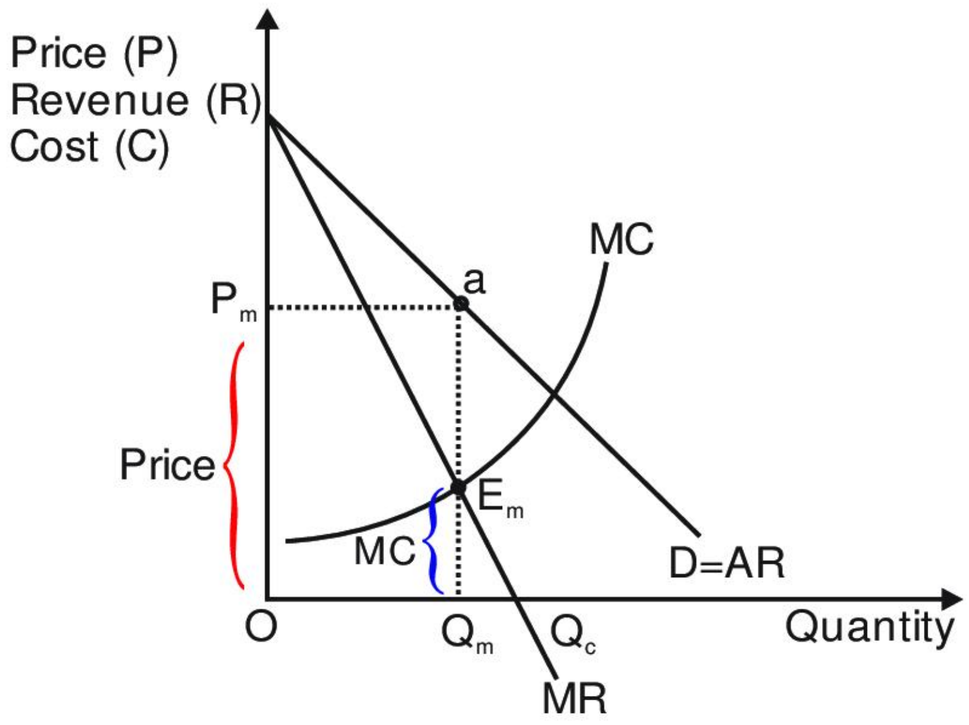


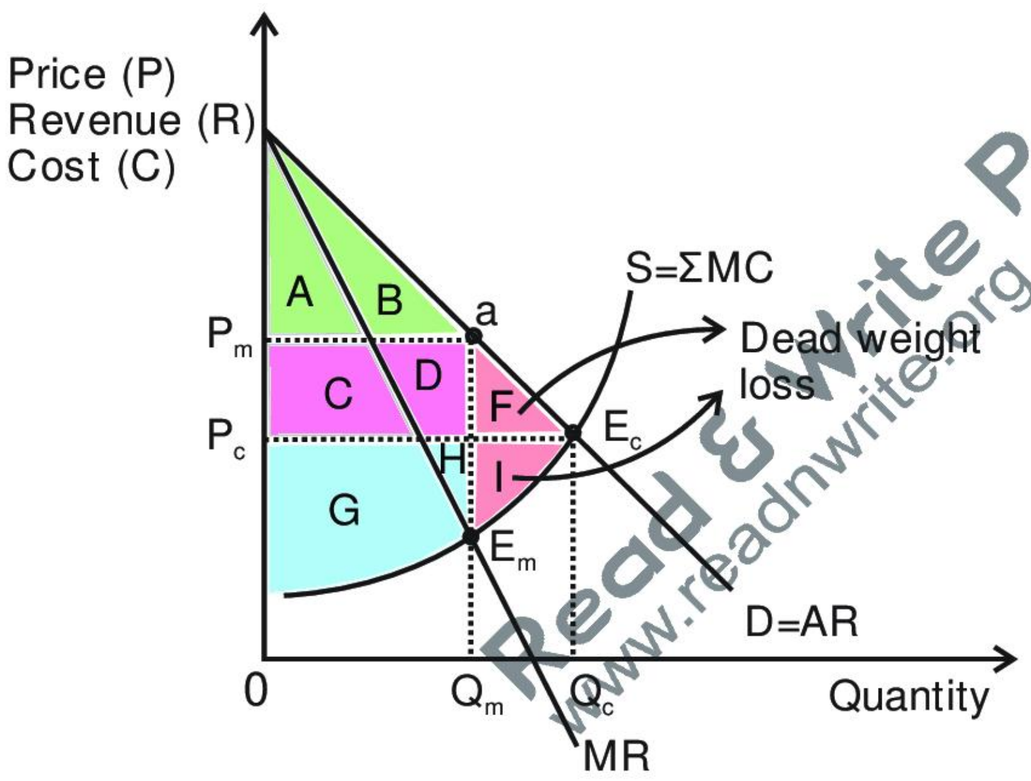
6. Allocatively inefficient

In the case of a monopoly, consumers have to pay a price which is greater than the marginal cost of production. This reduces consumer welfare. According to the diagram below, consumers have to pay the price OP_m when the marginal cost is E_mQ_m and, therefore, imperfect markets like monopolies with their objective of profit maximization fail to be allocatively efficient (since they do not produce output for which P=MC).



7. Deadweight loss

Let us now make a comparison between the two extreme market structures. The most important underlying assumption will be that regardless of their size firms will have the same cost curves.



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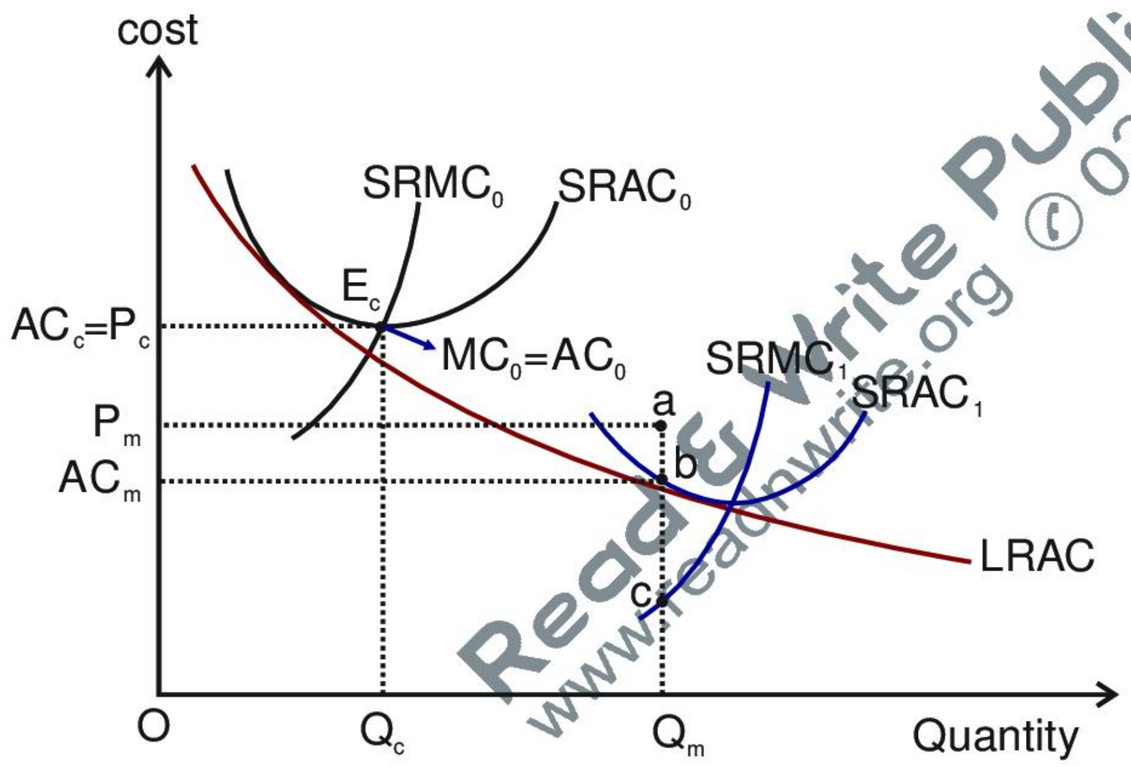
	Perfect competition	Monopoly
Equilibrium	D=S	MR=MC
Price	OP_c	OP_m
Quantity	OQ_c	OQ_m
Consumer surplus	ABCDF	AB
Producer surplus	GHI	GHCD
Deadweight loss	–	FI
Consumer surplus converted to producer surplus	–	CD
Economic efficiency	yes	no

It can be observed from the above figure that the monopolist's output will be where MC=MR, which is output Q_m and the price charged will be P_m.A perfectly competitive industry produces at a point where D=S (as D=AR while S=ΣMC, where S=ΣMC shows the summation of all MC curves of all firms in the industry) or AR=MC. Therefore, the price charged will be P_c and output will be Q_c. This proves that a monopolist charges consumers a higher price and produces a lower output.

From a consumer's point of view, a monopoly is harmful for society because of its pricing and output decision. Because a monopoly charges a price above marginal cost, not enough consumers are willing to buy it for production to be allocatively efficient. Thus, the quantity produced and sold by a monopoly is below the socially efficient level. A monopoly converts consumer surplus to producer surplus or profits as quantified by the area "C+D" in the above diagram. Consumers lose because their surplus falls from "A+B+C+D+F" to "A+B" only. Underproduction in the monopoly leads to deadweight loss, as quantified by the area "F+I". Part of the deadweight loss, "F", shows the loss in potential consumer surplus, whereas "I" shows the loss in potential producer surplus. However, overall, the firm still gains, since total producer surplus has a net increase of "C+D−I".

Advantages of a Monopoly

1. **It avoids duplication, thereby saving resources**
   Too many firms operating in the same industry can lead to many of them producing the same product. This wastes resources, and is especially dissatisfactory when the use of scarce natural resources is involved such as water, oil, gas, and coal.
2. **The firm enjoys economies of scale**
   If the firm is the only producer of a good or service in the industry, it will most probably be large. This will allow it to benefit from economies of scale, which may result in lower prices and an increase in welfare. Monopolies are said to be helpful for the economy where the majority of the population is poor.



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According to the diagram above, a profit-maximizing imperfect market with abundant economies of scale is able to lower its average and marginal cost up to $SRAC_1$ and $SRMC_1$.A perfectly competitive firm, however, would not be able to achieve such economies of scale and would operate at $SRAC_0$ and $SRMC_0$. It is obvious that, although a profit-maximizing firm operating in an imperfect market is technically inefficient (i.e., it produces where AC > MC), it is still able to incur a lower cost (AC_m) than a perfectly competitive firm (AC_c). Moreover, a perfectly competitive firm charges a price of P_c, whereas the price charged by a firm operating in an imperfect market is P_m,which is below P_c.

3. The firm employs professionals and a specialized workforce

A monopoly makes it possible to employ a skilled workforce. This increases productivity and efficiency and, therefore, brings increasing returns. A skilled workforce may include accountants, analysts, business administrators, etc.

4. The firm ensures economic stability

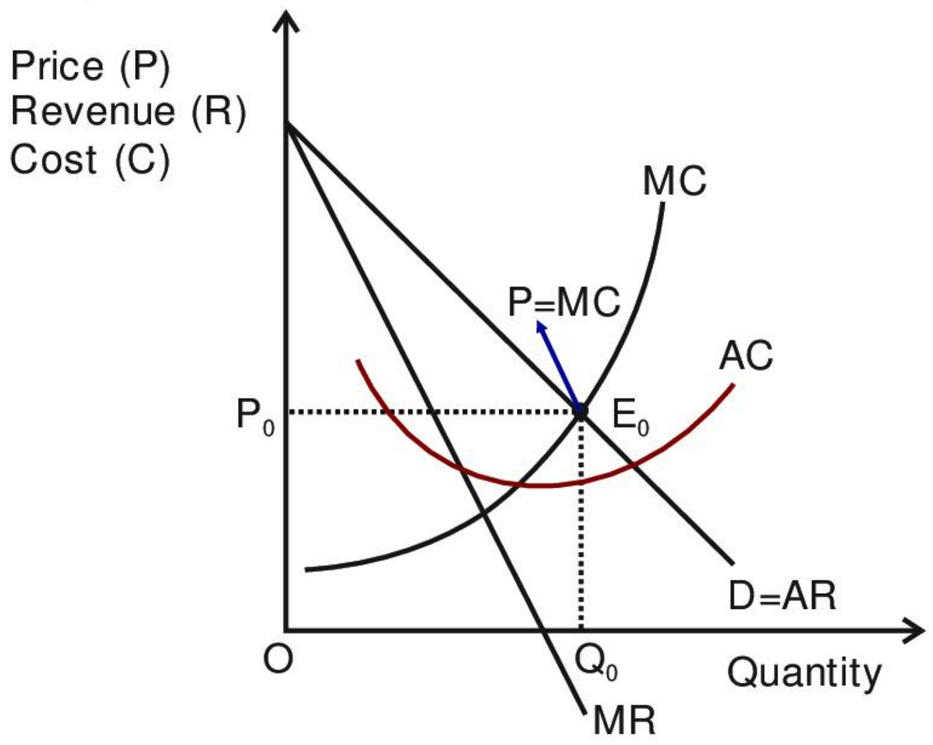
A monopoly has rare chances of bankruptcy. This stability of the firm in turn ensures the stability of the national economy. Monopolistic firms are usually key contributors to the GNP of a country.

5. The use of efficient and modern machinery

A monopolistic firm can afford to buy expensive machinery. Such machinery produces maximum output in low time with fewer resources.

6. Regulated monopolies

Monopolies are bad to society only when they are unregulated. Usually, the government regulates monopolies and consumer exploitation is made impossible by state authorities. If the government forces a monopolistic firm to adopt a policy of marginal cost pricing, production will be allocatively efficient, as shown in the diagram below.



Therefore, the demerits of a monopoly do not exist in reality to a significant extent, provided that they are regulated.

7. Price discrimination

Through price discrimination a monopolist can:

- Operate even profitably in situations where there are very high fixed costs involved which would normally cause a perfectly competitive firm to only incur losses.
- Ensure the availability of a service for consumers in areas and situations where demand for it is low, e.g., a transportation service to distant areas.
- Price discrimination is usually beneficial for the poor. People who are not financially well off are charged lower prices. Therefore, price discrimination helps an economically disadvantaged group.

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8. Research and development

A monopolistic firm can afford to undertake research and development. Through product innovation, new varieties of goods are introduced and the quality of products is improved. Through process innovation new cost-saving methods of production will be introduced.

9. Incorrect comparison

Usually, a monopoly is regarded as being bad for society when compared to a perfectly competitive market. However, perfect competition, despite being ideal, is primarily a theoretical case which does not exist in the real world. Therefore, a monopoly should be compared with existing market structures, i.e., oligopoly and monopolistic competition, in which too many resources are wasted on competitive advertising. A monopoly can utilize these resources in order to fund product innovation and provide other facilities to consumers.

10. Guaranteed profits

Perfect competition and monopolistic competition cannot ensure profitability in the long run because of freedom of entry and exit. Therefore, these firms will be reluctant to expand. However, the profits earned by a monopoly enable it to offer better products, provide benefits to its workforce, and invest in the economy.

11. Monopolies do not always aim for supernormal profits

Another misconception regarding monopolies is that they always aim for supernormal profits. This is not true. Neither do all monopolies aim for nor are all monopolies capable of earning supernormal profits. Instead, monopolies might be aiming for sales revenue maximization, growth maximization, output maximization, or even satisficing profits. Therefore, they will charge a lower price and produce more output as compared to the traditional theory of profit maximization.

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Past Papers Questions

Topic : Economic Efficiency, Market Failure & Government Policies

(Nov 2014/P43/Q3/b)
Discuss whether firms operating in a market structure of monopolistic competition are less efficient than those operating in perfect competition. [13]
(June 2014/P43/Q2)
There is concern about conservation of the environment, prevention of waste and efficient use of resources. Economic theory is clear on how to allocate resources efficiently in a market but in reality such allocation is a problem.
Discuss this opinion. [25]
(Nov 2014/P41/Q7)
The transfer of some functions of the public sector to the private sector is the best way of ensuring efficiency. It is, therefore, worthwhile.
Is this an argument with which you agree? [25]
(June 2014/P41/Q2)
There is concern about conservation of the environment, prevention of waste and efficient use of resources. Economic theory is clear on how to allocate resources efficiently in a market but in reality such allocation is a problem.
Discuss this opinion. [25]
(June 2014/P42/Q3)
'The profitability of firms is a measure of their efficiency. The higher the profit, the greater the efficiency. High profits should, therefore, be encouraged.'
Do you support this argument? [25]
(November 2013/P41/Q7/a)
Explain what is meant by efficiency in the use and the exploitation of resources.[12]
(November 2013/P41/Q7/b)
Discuss whether the creation of income through such projects as the building of airports should be left to the private sector. [13]
(Nov 2012/P41/Q7/a)
Explain what is meant when it is said there might be inefficiencies in the production of goods and in the allocation of resources. [12]
(Nov 2011/P41/Q2/a)
The removal of imperfections in the market leads to an increase in efficiency in the allocation of resources. Discuss whether you agree with this view. [25]
(June 2011/P42/Q2)
The use of cars causes market failure. To achieve an efficient use of resources it would be better if governments intervened to affect both the production and the use of cars. Explain the meaning of the terms 'market failure' and 'the efficient use of resources' and analyse whether economic theory can be used to support this argument. [25]
(June 2011/P41/Q2)
Discuss whether economic efficiency can be improved if governments are involved in the regulation and provision of goods and services when there is market failure. [25]
(Nov 2010/P41/Q7/b)
Economic analysis states that the aims of the government include economic growth and economic efficiency.
Is economic efficiency better achieved by the market mechanism rather than by government microeconomic policy? [13]
(Nov 2010/P41/Q2/a)
In 2009 there were huge fires in Australia which destroyed much property and countryside. The government promised to allocate a large amount of money and resources to help with the restoration of the area.
With the help of diagrams explain what is meant by efficiency in the use of resources. [12]
(June 2010/42/Q2)
In 2007 the UK Competition Commission indicated that failure in the market mechanism would result in both winners and losers.

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(a) Explain why producers are usually the winners and consumers are usually the losers when the market fails. [12]
(b) Discuss what the government might do when there are losers because the market mechanism has failed. [13]
(June 2010/P41/Q2)
(a) Explain what is meant by an efficient market equilibrium. [12]
(b) Discuss how the market mechanism might fail in the allocation of resources. [13]
(Nov 2009/P41/Q2)
There has been much discussion recently about the effect of climate change and the efficient use of economic resources. Discuss whether the efficient allocation of resources can be achieved only if governments are involved in the process. [25]
(June 2009/P4/Q7/b)
Discuss whether an efficient allocation of resources can be obtained only if large-scale investment is undertaken by the public sector rather than the private sector. [15]
(June 2008/P4/Q2)
The government in Namibia stated that electricity prices should cover cost and should also be based on the principle of allocative efficiency.
Discuss whether this approach to pricing can be supported in theory. [25]
(Nov 2007/P4/Q4/a)
The World Bank has given a loan to support the Ugandan government's road development programme. Improved roads into economically productive rural areas will have a major impact on the country's economy.
Explain why projects such as road building are often undertaken by the government, rather than by the private sector. [10]
(June 2007/P2/Q2/a)
Explain what is meant by productive and allocative efficiency. [12]
(Nov 2006/P4/Q2/b)
Does the price mechanism allocate scarce resources efficiently? [15]
(June 2006/P4/Q2)
'Governments, unlike the private sector, can create some of the necessary conditions for the efficient allocation of resources. It is, therefore, best if there is as much government involvement in the economy as possible.' Discuss whether you agree with this opinion. [25]
(Nov 2006/P4/Q2/a)
Explain what is meant by the term 'economic efficiency'. [10]
(Nov 2005/P4/Q2)
The French government stated that it was keen to achieve economic efficiency through policies that encouraged a free market. Despite this, in 2003, it bought 30% of a private French industrial group, which was facing bankruptcy. The company is one of France's major engineering groups employs over 110 000 people.
(a) Explain what is meant by efficient resource allocation in a free market. [10]
(b) Would you agree that in some circumstances it is best to accept decisions such as that of the French government and abandon the search for economic efficiency through the free market? [15]
(June 2005/P4/Q6)
Discuss the assertion that the market system is not able to allocate resources efficiently. [25]
(June 2004/P4/Q5)
In many cities the level of traffic congestion is causing increased concern.
(a) Discuss whether the existence of traffic congestion in cities might be considered as evidence of market failure.[12]
(b) Analyse what might be done when market failure does exist. [13]
(Nov 2004/P4/Q2)
Discuss whether economic efficiency as described in text books is likely to be able to be achieved in practice. [25]
(Nov 2002)Q2
In 2001 in the UK a widespread disease among cattle and sheep closed off large parts of the countryside. The government decided to give aid to agriculture but not to tourism, both of which were badly affected. Comment on the government's actions in terms of allocative efficiency and equity. [25]
(June 2002)
"Economic analysis is preoccupied with efficiency."
(a) Explain what economists mean by the term 'efficiency'. [10]

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(b) Discuss how governments might use the concept of efficiency in deciding economic policy. [15]
(Nov 2002)Q3
(a) Explain what is meant by productive and allocative efficiency.[10]
(b) 'A firm should be encouraged to maximize profits because this makes it efficient.' Discuss whether this argument is true for a firm operating in an imperfect market. [15]
(Nov 2000/a)
In 1998 two petrol companies, Shell and Texaco, stated that they proposed to co-operate with each other to bring greater efficiency in a competitive market.
Distinguish between productive efficiency and allocative efficiency. [10]
(June 1993/b)
Is the existence of normal profit an indication of the efficient allocation of resources?[10]
(June 1991/b)
Which do you believe to be the more efficient market structure? Monopoly or Monopolistic Competition? [17]

Topic : Advantages & Disadvantages of Market Structures

(June 2013/P41/Q2)
It is important that an economy makes the most efficient use of its resources. This can only be done if firms are allowed to increase in size. Government regulation of firms should, therefore, be minimised.
Discuss whether you agree with this statement. [25]
(Nov 2012/P43/Q3/b)
'Monopolies create a deadweight loss. They should always be discouraged.' Discuss this opinion. [13]
(Nov 2012/P42/Q3/b)
Discuss whether a firm in monopolistic competition is more likely to be in the public interest than a firm that is a monopoly. [13]
(Nov 2011/P43/Q2)
'There is little difference between perfect and imperfect markets. They all have profit maximization as an aim, they all are subject to competition and they all exploit resources for the producers' benefit and not the consumers.'
To what extent do you agree with this statement? [25]
(Nov 2010/P43/Q3)
It is suggested that there are so many benefits from large-scale production that all firms should be encouraged to grow in size and there should be no government restriction on such growth. Do you agree with this opinion? [25]
June 2010/42/Q3
In March 2009, the government of France agreed to pay 250 million Euros to the car manufacturer Renault, which employed 63 000 workers, on condition that it would not reduce the number of French jobs or factories. General Motors, a US car manufacturer which employed 600 000 workers, said that it needed $2 million in government aid to avoid bankruptcy.
(a) Describe the characteristics and likely pricing policy of the market structure in which a car manufacturer is likely to operate. [12]
(b) Discuss whether economic theory supports the idea that governments should encourage all large organisations. [13]
(June 2010/P41/Q3/b)
Discuss how the output and pricing policy adopted by a firm might differ depending on the market structure in which it operates. [13]
(Nov 2009/P42/Q2/b)
BHP Billiton and Rio Tinto have monopoly powers and are mining a natural resource. Discuss why the governments of the countries in which these companies operate might become concerned about this. [13]
(June 2009/P4/Q4/a, b)
Airbus, a large aircraft manufacturing company, announced in 2007 that its goal was to increase its $475 million research budget by 25 % in order to try to develop a more environmentally friendly aircraft that had lower fuel consumption.
(a) Explain why Airbus is likely to be in an imperfect rather than a perfect market structure. [10]
(b) Economics textbooks sometimes criticise firms in imperfect competition as being against the public interest. What does this mean, and how far does the Airbus announcement prove the textbooks wrong? [15]

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(June 2008/P4/Q4)
Large firms necessarily become monopolistic. Monopolies adopt practices that are undesirable. Therefore, large firms should be regulated by governments. Discuss whether there is any truth in this argument. [25]
(Nov 2007/P4/Q3/a)
In 2005 London Energy stated that as a company it invested millions of pounds in improving efficiency to reduce costs. However, as world energy prices had increased significantly, it had been forced to increase the price it charged the customer.
Explain how an increase in expensive investment by a company might result in a reduction in costs. [12]
(June 2006/P4/Q4)
Large organisations face no competition. There is, therefore, no choice. Small competitive businesses are a better means of providing for consumers' needs. Do you agree with this argument? [25]
(Nov 2006/P4/Q4/b)
In 2004 the Chinese government approved a deal with BAT (formerly British American Tobacco) to enable them to become the first foreign manufacturer of cigarettes in China for at least 50 years. BAT said that it would invest $1.5 million in China and that it would take about two years before the factories were running efficiently. It is estimated that China has 300 million smokers and is the world's most important cigarette market.
Discuss how BAT's investment might be likely to affect its profits in the short and long run.[12]
(June 2005/P4/Q5)
Gillette, the world's largest razor maker, announced in August 2003 that its annual profits had risen by 15%. In the same period, its sales increased by 11% as there was increased demand for its Sensor3 and Mach3Turbo razors and a reduction in the price of Duracell batteries, which Gillette produces. However, Gillette faces strong competition from Energizer Holdings, which sells batteries and Schick razors. Energizer introduced a new four-blade razor in September 2002 and increased its advertising and product promotion. Gillette lost US market share and announced it planned to increase expenditure on marketing.
Explain how firms are said to behave in oligopolistic markets and discuss how far this is supported by the above statement. [25]
(Nov 2004/P4/Q7/a)
In each of the countries Ghana, Nigeria and Zimbabwe internet services are provided by only a few large companies.
Consider who might benefit when a market consists of only a few large companies. [12]
(Nov 2003/P4/Q4)
Sony, the Japanese company, is involved in insurance and on-line banking as well as computers, electronics, and computer games.
(a) Explain why a company might wish to produce a diverse range of products rather than specialise. [10]
(b) Sony is a large company that can influence the price of its products. Discuss whether imperfect market structures which allow such companies are beneficial. [15]
(Nov 2002)Q2
'In a free competitive market, a shortage causes price to rise, a surplus causes price to fall. In some markets this does not happen because a minimum price is fixed by producers.'
(a) With the aid of diagrams and examples, explain why prices rise when there are shortages and fall when there are surpluses. [10]
(b) Discuss the factors that a group of companies might consider when deciding to fix a minimum price in a market. [15]
(June 2002/a)
'Huge scale is at the heart of everything the giant US retail company Wal-Mart does. Its biggest stores are ten times the size of an average UK store.'
Discuss whether the development of large companies is always a benefit to a society. [13]
(Nov 2001/ b)
Discuss why oligopoly is a more common market structure than perfect competition.[15]
(Nov 2001/b)
Discuss the circumstances in which a monopoly could be beneficial. [15]
(Nov 1999)
(a) What are the main characteristics of a monopoly market?[12]
(b) To what extent is it true that monopolies are bad for the consumer? [13]

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(June 1999)
In 1997, a merger was proposed between two of the world's largest telecommunication companies. Analyse the possible effects when a merger of two large companies occurs and discuss why there is sometimes opposition to such mergers.[25]
(June 1995/a)
Explain how in economic theory a monopolist determines price and the output.[10]
(Nov 1994)
'No point is better accepted than that the monopoly price is higher and the output smaller than is socially ideal. The public is the victim.
(JK Galbraith, Economies and the Public Purpose, 1974)
(a) Use economic analysis to explain Galbraith's statement that 'monopoly price is higher and the output smaller than is socially ideal'. [15]
(b) Do you consider that when monopoly exists the public is always the 'victim'?[10]
(June1990/b)
Why is it possible for competition among firms to forces prices down to ruinous levels in an industry in which production is capital intensive? [17]

Topic: Externalities, Concepts,& Effects

(Jun 2014/P23/Q3/a)
Explain, using appropriate diagrams, the meaning of the term 'externalities'. [8]
(November 2013/P21/Q2/a)
Explain, using a diagram, how the social cost of consuming some goods can exceed the private cost of consuming them. [8]
(Nov 2010/P23/Q2/b)
Discuss the economic consequences of externalities associated with production and consumption. [12]
(June 2010/P22/Q3/a)
With the help of a diagram, explain why some goods are produced in quantities greater than is socially desirable. [8]
(Nov 2009/P22/Q3/b)
Discuss whether it is likely that the private costs and the social costs of production would be identical. [12]
(Nov 2005/Q2/a)
Explain the effects of externalities on the allocation of resources. [8]
(June 2002/a)
Explain, with examples, the meaning of private costs and external costs. [8]
(Nov 2000/a)
Explain and illustrate what is meant by
(i) an externality,
(ii) a public good, and
(iii) a private benefit. [12]
(June 1998/a)
Smoke from chimneys, exhaust fumes cars and gases from power stations all poison the atmosphere and cause acid rain. The rain then causes forests, fish and wildlife to die and buildings to crumble.
Use the above comment to explain and illustrate how private and social costs differ. [10]
(June 1995/a)
Explain and illustrate what is meant by the term 'externalities'. [10]
(Nov 1993/a)
Explain what is meant by
(i) private cost and
(ii) social cost
(iii) in the production of food and service. [10]
(Nov 1993/b)
Discuss the external to which it is possible and desirable to make private and social costs coincide. [15]
(June 1993/b)
With the aid of examples, explain the terms, private benefit and social benefit. [10]

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(Nov 1991/a)
Define and give examples of
(i) external costs
(ii) external benefits. [8]

Topic: Public, Private, Merit, & Demerit Goods

(Jun 2014/P21/Q3/a)
Explain the difference between private goods and public goods, and why it is possible for a business to make a profit in the supply of private goods but not in the supply of a public good. [8]
(Nov 2012/P23/Q2/b)
Discuss why in many countries some services, such as education and healthcare, are supplied both by the government and private producers. [12]
(June 2012/P22/Q3/b)
Discuss why some governments decide that it is undesirable to leave the provision of private goods such as train travel, to the private sector. [12]
(Nov 2011/P22/Q3/b)
Discuss whether healthcare can and should be provided by the free market. [12]
(Nov 2011/P21/Q2/b)
(b) Discuss whether economists would classify healthcare and national defence in the same way.[12]
(June 2011/P22/Q2/b)
(b) Discuss the accuracy of the definition of public and merit goods as 'goods that must be provided by the government'. [12]
(June 2010/P22/Q3/b)
Discuss whether national defence or a public park is the better example of a public good. [12]
(Nov 2009/P22/Q3/a)
Explain why a lighthouse is often given as an example of a public good while a light bulb is not.[8]
(Nov 2008/Q3/a)
Explain the market failure which arises from the characteristics of public goods. [8]
(June 2006/b)
Explain, with examples, the difference between a demerit good and a merit good. [12]
(Nov 2004/a)
Explain the meaning of 'public good' and private good. [8]
(Nov 2002/a)
Explain, with examples, the meaning of the terms public good and merit good. [8]
(June 2001/a)
How do merit and demerit goods differ from public goods? [12]
(June 1999/a)
Using appropriate examples, distinguish between a public good and a merit good. [10]
(June 1999/a)
Discuss the view that the economic activity of the government should be restricted to the provision of the public goods. [15]
(Nov 1997/a)
With the aid of examples explain the terms
(i) externality and [5]
(ii) public goods. [5]
(Nov 1996/a)
Define, with examples, a public good and a merit good.[10]
(Nov 1996/a)
Distinguish between public goods, merit goods and private goods and consider into which classification the reprocessing of atomic waste should be put. [15]
(Nov 1995)
In 1994 the UK government decided to spend £ 12m to protect one river from industrial and sewage pollution, to monitor building development along the river and protect property from flooding. (Source: The Independent 4.8. 1994)

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(a) Distinguished between private goods, merit goods and public goods and discuss under which of these classifications river control and development should be placed. [15]
(June 1992/a)
Using examples compete and contrast public goods. with merit goods. [10]

Topic: Government Policies To Correct Market Failure

(Jun 2014/P23/Q3/b)
Discuss the most appropriate policy that a government should adopt when the production of a good gives rise to a negative externality. [12]
(Nov 2014/P21/Q2/b)
Discuss whether minimum price legislation or the imposition of an indirect tax is more effective in improving resource allocation when the consumption of a good causes negative externalities.[12]
(June 2013/P21/Q2/b)
Discuss the policies a government might adopt to ensure the correct price for merit and demerit goods is charged in the market. [12]
(June 2012/P21/Q3/b)
Discuss the economic reasons for subsidising public transport and taxing private transport. [12]
(June 2011/P23/Q2/a)
Discuss how the market system might be influenced by government intervention to provide appropriate quantities of goods and services. [12]
(June 2010/P21/Q3/b)
Discuss why certain goods and services are usually supplied directly by the government rather than through the market.[12]
(Nov 2009/P21/b)
Discuss whether government intervention always improves the operation of the market. [12]
(June 2009/Q3/b)
Discuss the advantages and disadvantages of using indirect taxes to deal with the negative externalities associated with some products. [12]
(June 2006)(b)
Discuss two methods that a government might use to influence the consumption of demerit goods. [12]
(Nov 2005/b)
Discuss the use of indirect taxes and subsidies by governments to deal with externalities. [12]
(June 2005/b)
Discuss the desirability of the direct provision of goods and services by the government. [12]
(Nov 2002/P2/Q4/b)
Discuss how a government might increase the provision of public and merit goods. [12]
(Nov 2003/P2/Q3/b)
Discuss whether an indirect tax is a satisfactory way to tackle a negative externality, such as air pollution. [12]
(Nov 2002/P2/Q2/b)
Discuss whether planning has any role to play in the allocation of resources in a modern mixed economic system. [12]
(June 2001/b)
Discuss what polices a government might adopt to achieve a more efficient allocation of resources where merit and demerit goods exist in markets. [13]
(June 1998/b)
Discuss what policies a government might adopt when private and social costs differ. [15]
(June 1992/b)
Discuss how public goods and merit goods could be provided and paid for. [15]
(June 1992)
Pollution is an example of a 'negative externality'. Explain what an externality is and comment upon the means available for controlling negative externalities. [12]
(Nov 1991/b)
Explain and comment on the policies which a government may adopt to
(i) Reduce external costs
(ii) Increase external benefits.[17]

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(June 1991)
(b) Identify and explain the causes of urban traffic congestion. [8]
(c) Suggest and comment on policies to lessen urban traffic congestion. [12]

Topic: Cost-benefit Analysis

(November 2013/P21/Q2/b)
Discuss, using examples, whether cost-benefit analysis is an effective way of decision making when allocating an economy's resources. [12]
(Nov 2011/P21/Q2/a)
Explain how a government's approach to making a decision about a construction project might differ from that of a private firm. [8]
(Nov 2010/P23/Q2/a)
Explain the difficulties of carrying out a cost-benefit analysis. [8]
(Nov 2008/Q3/b)
Discuss whether the use of cost-benefit analysis helps to improve economic decision making. [12]
(June 2002/b)
Discuss the role that cost-benefit analysis can play in government economic policy making. [12]
(June 2002/b)
Discuss the role that cost-benefit analysis can play in government economic policy making. [12]
(June 2000)
A local Council is concerned about the effect on the environment when shoppers take away and abandon, the shopping trolleys belonging to supermarkets. The Council is considering collecting the trolleys and charging the supermarket for their return.
(a) Explain what is meant by a private good and a demerit good and suggest the ways in which these concepts might apply in the above situation. [12]
(b) If you were asked to decide whether the Council should adopt the proposed policy how would you determine whether it was economically beneficial? [13]
(Nov 2000)
Discuss whether the above concepts are of any use in explaining why it is often the government and not private enterprise that is responsible for the development and operation of airports and roads. [13]
(Nov 1999)
You have been asked to work as part of a team appointment to carry out a cost-benefit analysis of the building of an additional runway at an international airport.
(a)Explain what is meant by the term cost-benefit analysis. [10]
(b)Discuss the problems that might be encountered in carrying out this analysis. [15]
(Nov 1999)
Discuss whether it is necessary to have government intervention in order to achieve an efficient allocation of resources.[25]
(Nov 1998/b)
Discuss, the difficulties of putting this into practice.[10]
(June 1998)
In Namibia, which has large areas of desert, a government report suggested that where the demand for water is greater than the supply, its price should be increased to ensure it is optimally allocated.
(a)What, according to economic analysis, is meant by 'an optimal allocation of resources'? [10]
(b)Should water be priced likely other commodities? [15]
(Nov 1997/b)
Is it possible to achieve an optimal allocation of resources where there are
(i) negative and
(ii) positive externalities? [15]
(June 1997/b)
You have been asked to collect some information about the economic effects on a town of a proposal to build a new fast road around it. Discuss how you might do this. [13]

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(Nov 1996/b)
Do you agree with the reassertion that the economic activity of the government should be restricted to the provision of public goods? [15]
(Nov 1995/b)
Discuss whether, according to economic analysis, government intervention can lead to a more efficient use of resources.[10]
(June 1995/b)
If a good or service gives rise to an externality, should it be provided by the government? [15]
(Nov 1994)
Buses in a city are unreliable because the city centre is congested by traffic. The buses often make a loss. It is proposed to withdraw all loss-making services and to demolish parts of the historic city to build a car park to reduce traffic flow.
Use the concepts of social costs and benefits to discuss whether you would support these proposals. [25]
(June 1994)
Everyone expects to drive their cars and have endless supplies of pure water from their taps but equally they expect to walk in the countryside and enjoy wildlife. Everyone would like the reservoir or motorway to be built somewhere other than where they are.
(J Wales, Investigating Social Issues)
(a) Explain the following economic terms:
(i) Opportunity cost,
(ii) externalities,
(iii) pareto optimality. [12]
(b) Apply these concepts to the welfare economic issues contained in the above statement. [13]
(June 1993/b)
Explain and illustrate what you understand by 'cost-benefit analysis' and discuss its use as a means of resource allocation. [15]
(Nov 1992)
'The existence of an externality implies market failure and means that the good should necessarily be provided by the government.' Discuss. [25]

Topic: Correct Price & Market Failure

(Nov 2014/P22/Q2/b)
Discuss whether prices are less important in allocating scarce resources in a mixed economy compared with a market economy. [12]
(June 2013/P21/Q2/a)
Explain why the free market is ineffective in arriving at the correct price for merit goods and demerit goods. [8]

Topic: Policies to Improve Efficiency

(Nov 2012/P41/Q7/b)
Discuss whether the best way to overcome market failure is to control private enterprise by means of taxation.[13]

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UNIT 11

Labour Market

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Demand for labour

- factors affecting demand for labour
- derivation of individual firm's demand for using marginal revenue product theory

b. Supply of labour

- factors affecting supply for labour
- net advantages and the long-run supply of labour

c. Wage determination in perfect markets

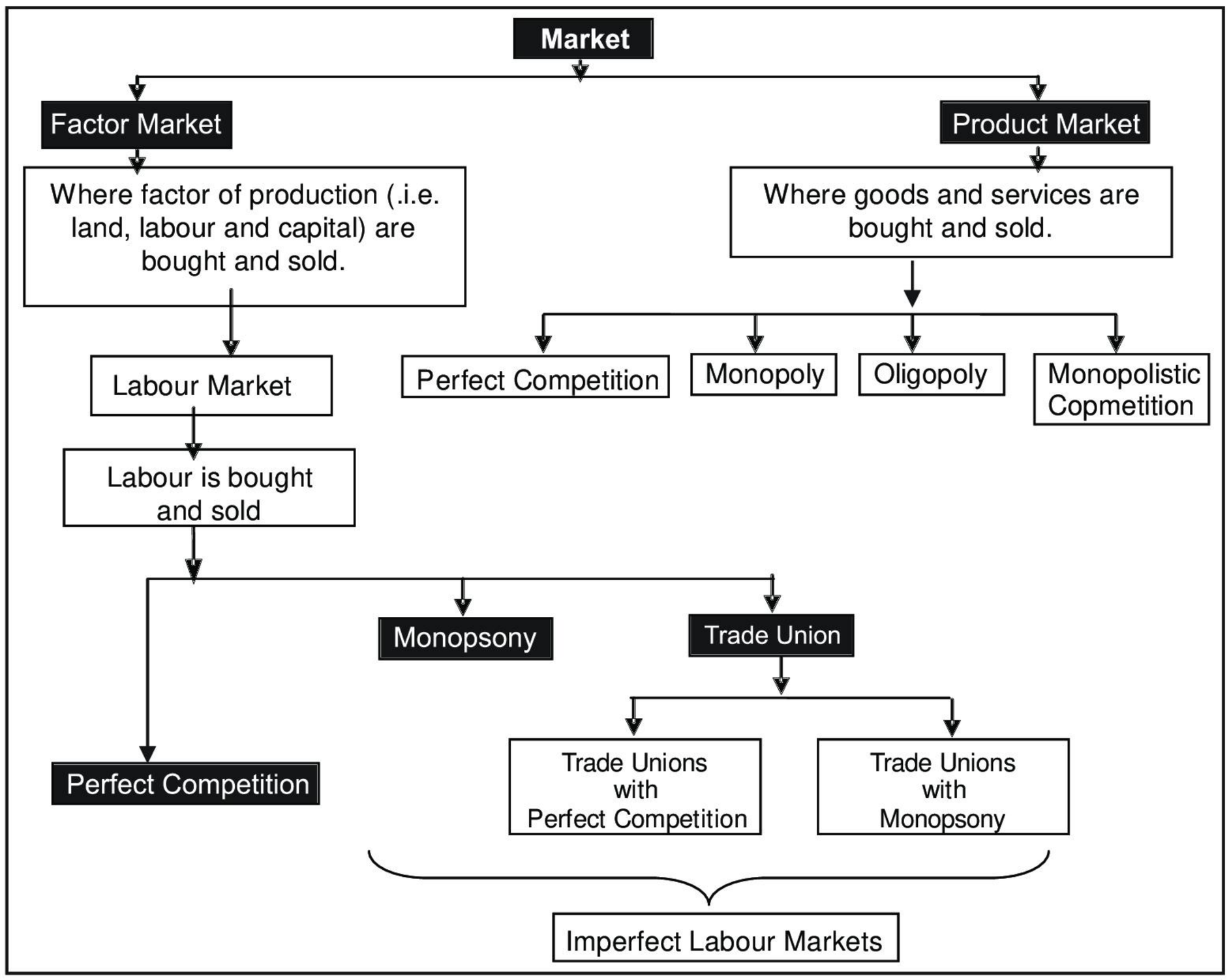
d. Wage determination in imperfect markets

- monopsony
- influence of trades unions on wage determination
- influence of government on wage determination

e. Competitive product and factor market forces determining wage differentials

f. Transfer earnings and economic rent

Unit 11 Labour Market



When looking at the market for labour, it is useful to make a distinction similar to that made in goods markets—i.e., the distinction between perfect and imperfect markets. We can gain a clearer understanding of the effects of power, or lack of it, in the labour market. Although, in practice, few labour markets are completely perfect, many do at least approximate to it.

The Supply Curve

1. Supply Curve for an Individual Worker

A supply curve shows the quantity that will be supplied to the market at any given price. For an individual worker, the “quantity supplied” is the number of hours worked over a time period, such as a year. The price of labour is the wage per time period (i.e., the wage rate). The wage rate that determines supply is the *real wage rate*(i.e., the money or nominal wage rate divided by the price level). This is because the worker decides how many hours to work by relating it to what the wage will buy.

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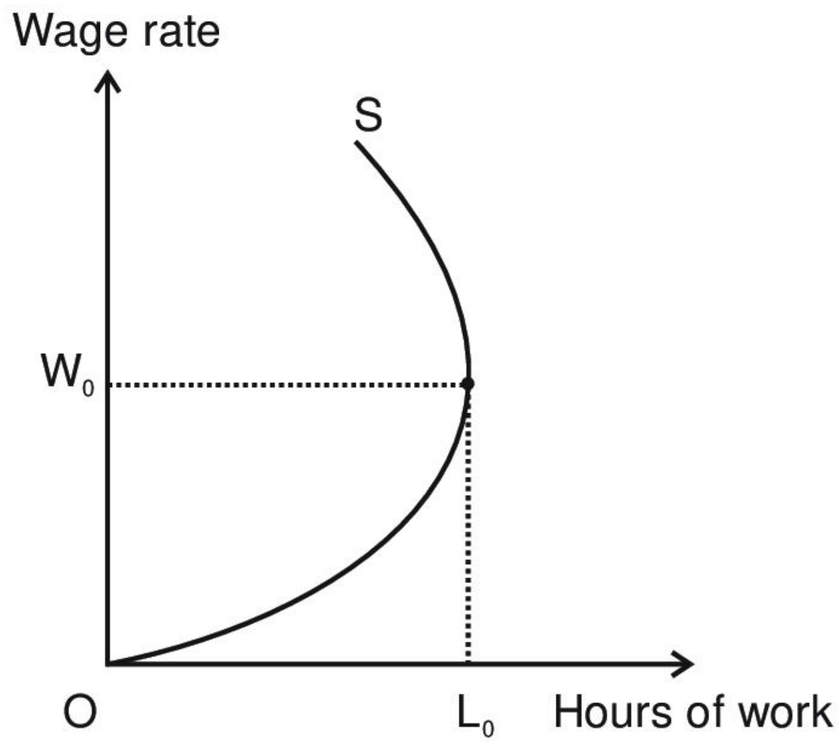

Between wage rates O and W_0, a rise in real wage rates will lead to an increase in working hours supplied. However, any increases in the wage rate beyond this will lead to a desire for shorter working hours.

To understand why this might be the case, consider a part-time factory worker. Initially, she is low paid, as are nearly all part-time workers. She is paid an hourly wage (that is, the wage rate represents an amount of money paid to her per hour of work completed). The firm she works for then doubles her real wage rate. She is likely to respond to this by wanting to work longer hours and perhaps become a full time worker. Further increases in the real wage rate might persuade her to work overtime. However, there are only 24 hours in a day and 365 days in a year. Eventually, it is likely that increases in the wage rate will make her want to work less and enjoy with the money she earns instead. Put another way, she is choosing to buy leisure time by forgoing the wages she could otherwise have earned and the goods she could otherwise have bought had she worked during those same hours. This is an example of the concept of opportunity cost.

This process can be seen at work over the past 100 years in UK. Real wage rates have risen considerably but hours worked have fallen. The typical Victorian working week was 60 to 70 hours with few or no holidays. Today, average hours worked per week for full-time workers are down to about 42 hours with a typical holiday entitlement of 4 weeks per year. Workers have responded to increases in wage rates by supplying less labour.

Income and Substitution Effects

For an individual worker, the cost incurred for doing work is the leisure he or she sacrifices. Similarly, the cost incurred by the worker for choosing leisure time is the wage that he or she could have earned by working instead. Any change in real wage rates will have two effects:

- Income Effect
- Substitution Effect

1. Income effect

- The income effect is defined as the change in the willingness of a worker to work due to a change in his or her real income (caused by changes in his or her wage).
- However, work is arguably an inferior good. The higher the income, the fewer hours an individual will wish to work. For instance, it is pointless to be able to buy tennis or squash equipment if you don't have the time to play. Earning more money has little use if you cannot take the time off to enjoy it.
- So the income effect of work tends to be negative for most individuals. The higher the income, the less the work and the more leisure time is demanded.

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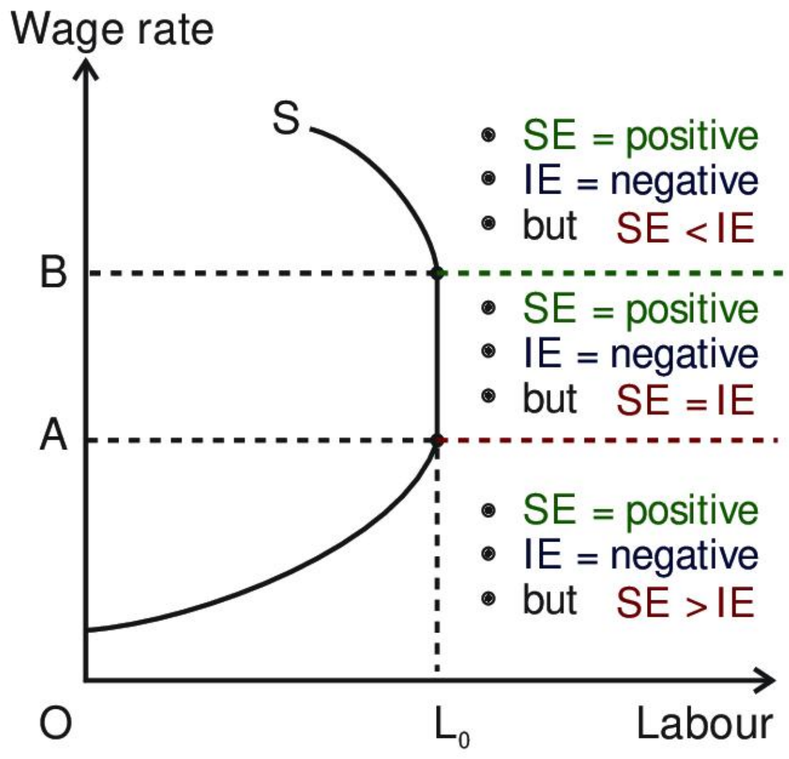
2. Substitution effect

- The substitution effect of a wage change may be defined as the change in the willingness of a worker to work due to a relative change in the prices of work and leisure.
- An increase in the real wage rate means that the reward for working increases. For instance, let us assume that a worker is initially paid $10 per hour. If his wage rises to $20per hour, the wages earned by one hour's worth of work earnings (i.e., $10) can now be sacrificed for half an hour of leisure.
- Leisure is now more relatively expensive. When the wage rate changes from $10 per hour to $20 per hour, the worker now has to sacrifice $20 for benefiting from an hour's worth of leisure.
- Therefore, a worker will substitute work for leisure if the rate of pay increases, and this increase in his willingness to work due to the relative cheapness of work is the substitution effect of the wage increase.

The backward-bending supply curve occurs because of the interaction of the income and substitution effects.

- At low levels of income, the positive substitution effect outweighs the negative income effect of a wage rise. Hence, a rise in the pay of these workers leads to an increase in the number of hours worked.
- At higher levels of income, the positive substitution effect is likely to be equally matched by a negative income effect. Wage increases then have no effect on working hours.
- But at very high levels of income, the positive substitution effect of a wage increase is exceeded by a negative income effect. Hence, the worker will choose to work for fewer hours.

This can be shown in the diagram as follows.



At wage rises up to QA, higher wage rates will lead to increased hours of work. Between A and B supply curve is vertical, showing that increased wages have no effect on hours worked. Between A and B the negative income effect cancels out the positive substitution effect as wages rise. Above OB the supply curve slopes backward showing that, the negative income effect of a wage rise more than offsets its positive substitution effect.

2. The Market Supply Curve for Labour

The market supply curve of labour in a perfect market can be derived through the horizontal summation of all individuals' labour supply curves of both existing and new labour.

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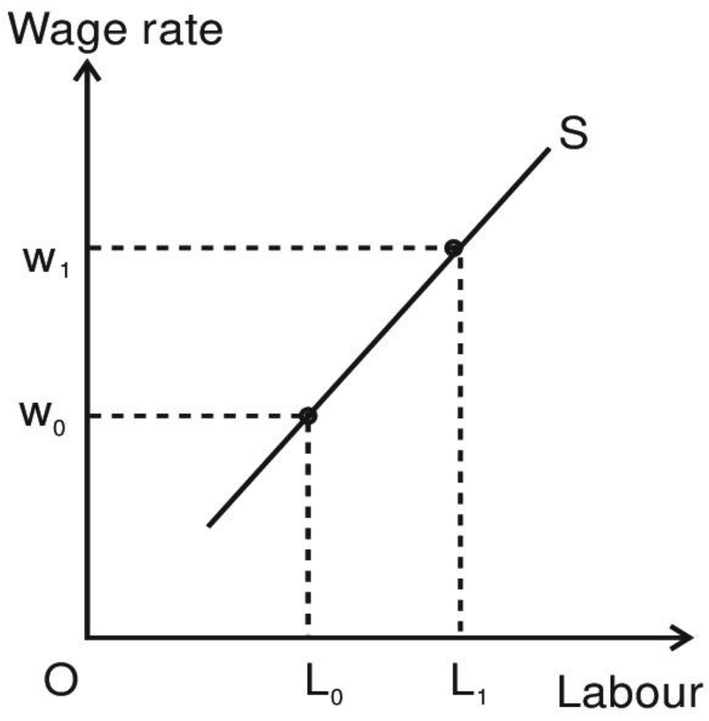

Although the supply curve of labour for individuals is backward bending, the shape of the market supply of labour is only upward sloping. This is because an industry can increase the number of hours worked by its labour force in two ways:

- It can increase the number of hours worked by its **existing labour** force
- It can recruit **new workers**

A rise in real wage rates, all other things being equal, may or may not increase the supply of labour by individual workers in the industry. However, it is likely to attract new workers into the industry. These new workers may be from other industries or they may be workers who previously did not hold a job, such as a house person or the unemployed. Therefore, the supply curve of labour for an industry is likely to be upward sloping—the ability of firms to recruit new workers outweighing any possible discouraging effects on existing workers. The higher the industry real wage rate, the more workers will want to enter that particular industry.

3. Supply of Labour for a Perfectly Competitive Firm:

Under a perfectly competitive labour market:

- There are **many firms(buyers of labour)**, so that any single firm purchases only a small proportion of total labour and is unable to influence the market wage rate.
- Firms in a perfectly competitive labour market are **wage-takers** and, at a given wage rate, they can employ as many units of labour as they want.
- Therefore, the supply of labour to a single firm in a perfectly competitive labour market is **perfectly elastic**.

Consider the following example:

Units of labour employed (L)	Market wage rate per hour (W)	Total factor cost ($TC_L = W \times L$)	Marginal factor cost ($MC_L = \frac{\Delta TC_L}{\Delta L}$)	Average factor cost ($AC_L = \frac{TC_L}{L}$)
1	$5	$5	$5	$5
2	$5	$10	$5	$5
3	$5	$15	$5	$5
4	$5	$20	$5	$5

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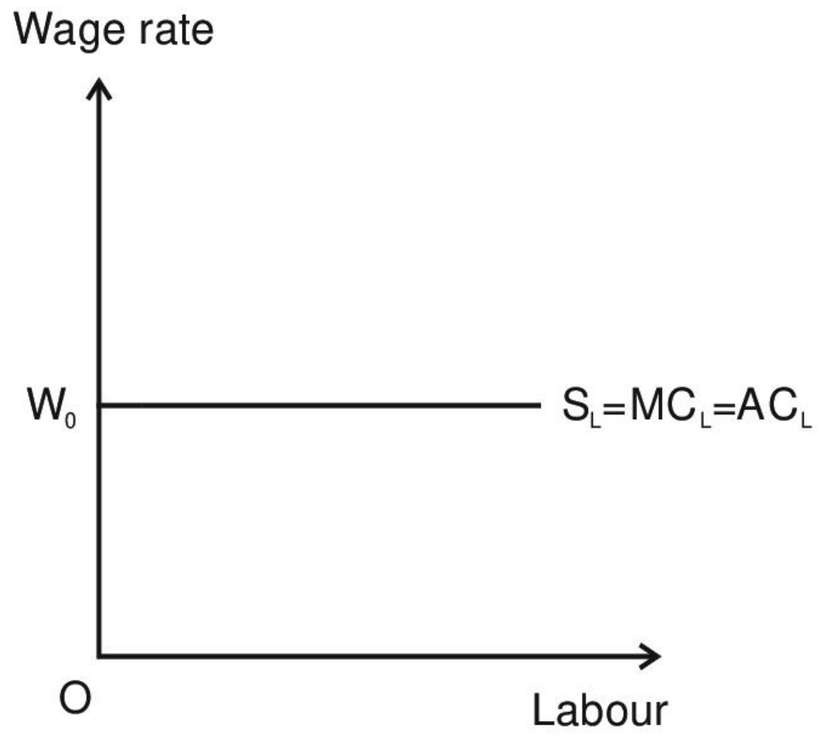

Where

- MC_L = Marginal factor cost (MFC) or marginal cost of labour. It is the cost of employing an extra unit of labour.
- AC_L = Average factor cost (AFC) or average cost of labour. It is the cost of labour to a firm per unit of labour employed, which also acts as the supply curve of labour for an individual firm.
- TC_L= Total factor cost (TFC). It is the total cost of labour employed.
- Price of labour = marginal cost of labour = average cost of labour
- $W = MC_L = AC_L$

4. Supply of Labour in a Monopsony

- A monopsonist firm is a single dominant buyer of a particular factor in the market.
- Since, in this case, the firm is the market for the factor, the supply of the factor service to the monopsonist is identical to its supply to the market. Thus, the supply curve to the firm is positively sloping upward from left to right. The firm can employ more units of the factor service by offering a higher price per unit.
- The MC_L curve to this AC_L curve will also be sloping upward.
- The MC_L curve will be above the AC_L curve throughout its length and will increase at a rate double that ofAC_L. The reason for this is that the wage rate has to be raised to attract extra workers. The MC_L curve will thus be the new higher wage paid to the new employee plus the small rise in total wages for existing employees—after all, they will be paid at a higher wage rate too.
- $AC_L = \frac{TC_L}{L} = \frac{W \times L}{L} = W$ = Wage rate
- The AC_L curve also represents supply.

Units of labour (L)	Wage rate (W)	Total labour cost ($TC_L = W \times L$)	MC_L	AC_L
1	$5	$5	$5	$5
2	$6	$12	$7	$6
3	$7	$21	$9	$7
4	$8	$32	$11	$8

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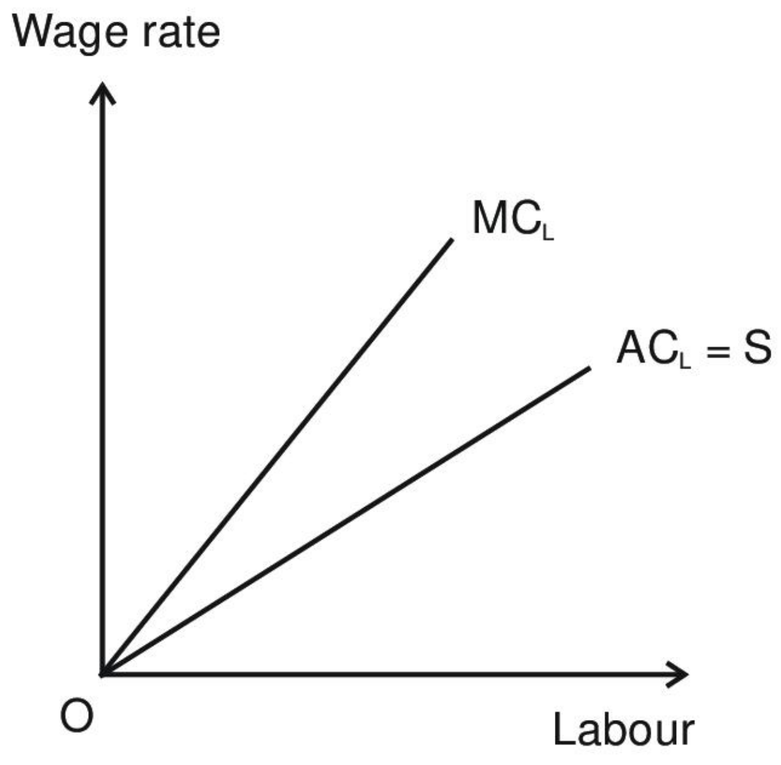

5. Supply of labour with a Trade Union:

- A trade union is an organization formed by workers who make a collective effort to further their own interests.
- Within an organization, an individual worker is likely to be in a relatively weak bargaining position compared to his or her employer. The employer possesses far great knowledge about everything, from safety standards to the profitability of the firm, than an individual worker. Moreover, the loss of an individual worker to a firm is likely to be far less significant than the loss of his or her job to the employee. So workers have organized themselves in unions to bargain collectively. Instead of each worker bargaining with the firm on a wide range of wage and employment issues, workers elect or appoint their union leader.
- Trade unions usually raise wage rates by setting a minimum wage limit in the market.
- The supply of labour will be unchanged for the range over and above the minimum wage limit, but will become horizontal at the minimum wage limit.
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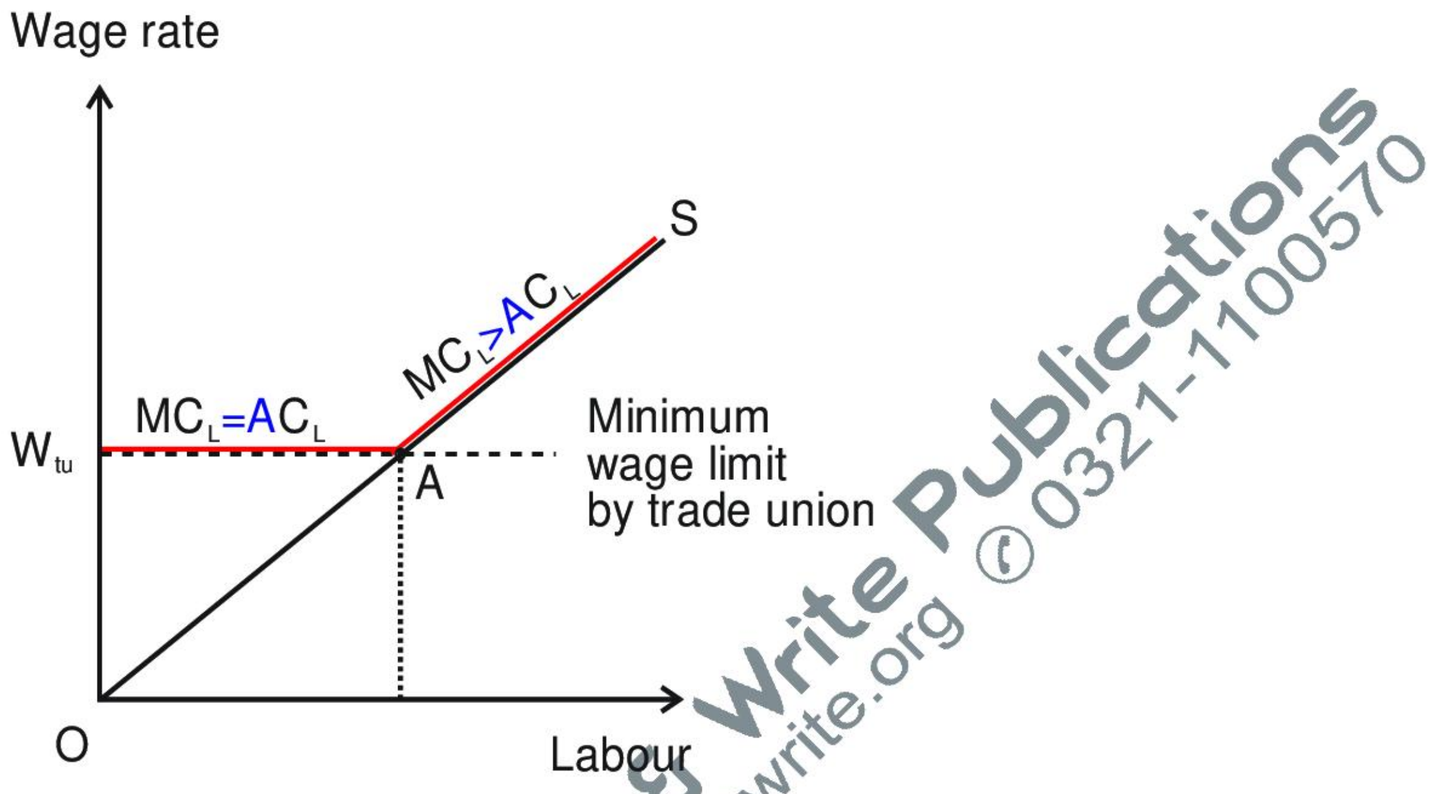

	Supply Curve	MC_L&AC_L
Before Trade Union	OS	$MC_L > AC_L$ throughout the supply curve.
After Trade Union	$W_{tu}AS$	$MC_L = AC_L$ for "$W_{tu}A$" part of the supply curve. $MC_L > AC_L$ for "AS" part of the supply curve.

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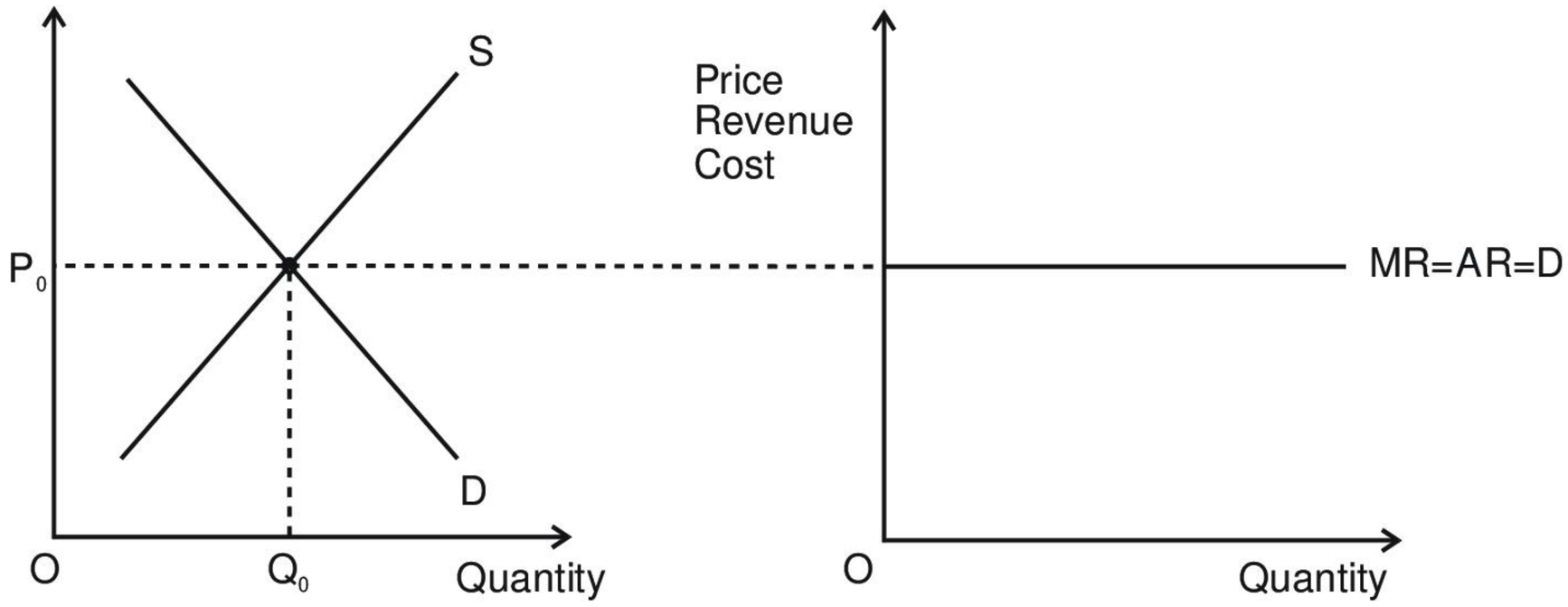
Demand for Labour or Marginal Revenue Product (MRP) Theory:

Assumptions

1. All units of a factor service are homogenous.
2. There is perfect mobility of factors, both with regard to occupational and geographical mobility.
3. There is perfect competition in the factor market and the commodity market.
4. Entrepreneurs are motivated by profit maximization.
5. The theory is based on the law of diminishing returns.

Explanation

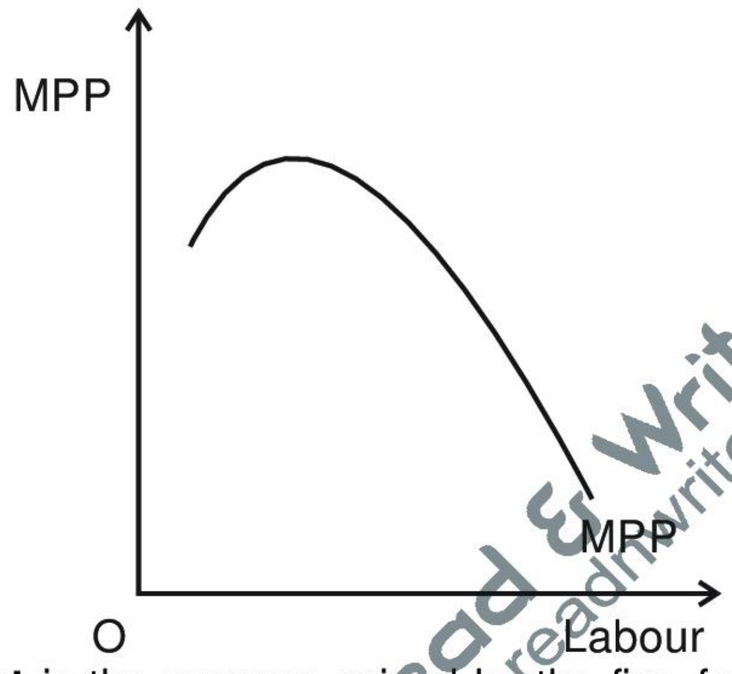
- **Marginal revenue** is the revenue gained by the firm from selling an extra unit of output produced.
- $\mathrm{MR} = \frac{\Delta \mathrm{TR}}{\Delta \mathrm{Q}}$



- In perfectly competitive product markets firms are price-takers and, therefore, for a perfectly competitive firm in a product market, MR=AR=P=D—as shown in the diagram above.
- **Marginal physical product** is the extra output produced by employing an additional unit of labour.

$$\mathrm{MPP} = \mathrm{MP} = \frac{\Delta \mathrm{TP}}{\Delta \mathrm{L}}$$

- According to the law of diminishing returns to a variable factor, a firm's marginal output will start declining if it combines more and more variable factors (labour) to a fixed quantity of fixed factors.



- **Marginal revenue product** is the revenue gained by the firm from the output produced due to employing an extra unit of labour. It is found by multiplying the marginal physical product with marginal revenue.

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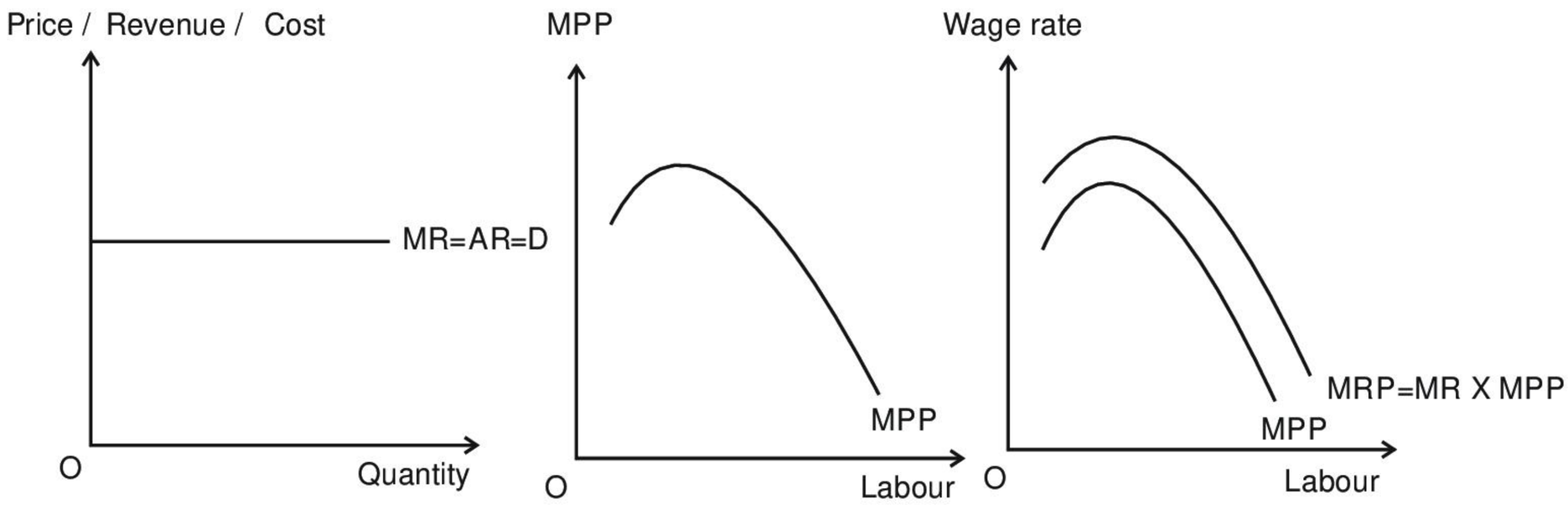
$$MRP = MPP \times MR$$

– The demand for labour or the marginal revenue product is based on the law of diminishing returns to a variable factor, and that is the reason why the MRP curve is also downward sloping. Multiplying downward sloping MPP curve with constant MR will cause a parallel shift from MPP to PRP as shown below:



The MPP is the extra output produced by the last worker. If the last worker produces 100 tonnes of output per week (MPP_L), and if the firm earns an extra $2 for each additional tonne sold (MR), then the worker's MRP is $200. This extra worker is adding $200 to the firm's revenue.

MRP Curve

In the short run, at least one of the factors of production is fixed. Assuming that all factors except labor are fixed, the law of diminishing returns states that the marginal output will start to decline if more and more units of one variable factor of production are combined with a given quantity of fixed factors.

This is shown in the table below. Labour is assumed to be a variable factor of production, whilst all other factors are fixed. As extra workers are employed, total output, or **total physical product (TPP)** increases. However, marginal physical product, the number of extra units of output a worker produces, starts to decline after the employment of the second worker. So, diminishing marginal returns set in with the third worker. Let us assume that the firm is in a perfectly competitive industry and, therefore, faces a horizontal, perfectly elastic demand curve. This means that a firm can sell any quantity of its product at a given price per unit. In the table, it is assumed that the price of the product is $10. The Marginal Revenue Product can then be calculated because it is the addition to revenue from the employment of an extra worker. For instance, the first worker produces 8 units and so, at a price per unit of $10, the worker's marginal revenue product is $80 ($10 ×8). The marginal revenue product of the second worker is $90 ($10 x 9).

Labor input (workers)	Total output in units (TPP)	Marginal Physical Product in units (MPP)	Price = MR ($)	Marginal Revenue Product in $ (MPP ×MR)
1	8	8	10	80
2	17	9	10	90
3	25	8	10	80
4	32	7	10	70
5	38	6	10	60
6	43	5	10	50

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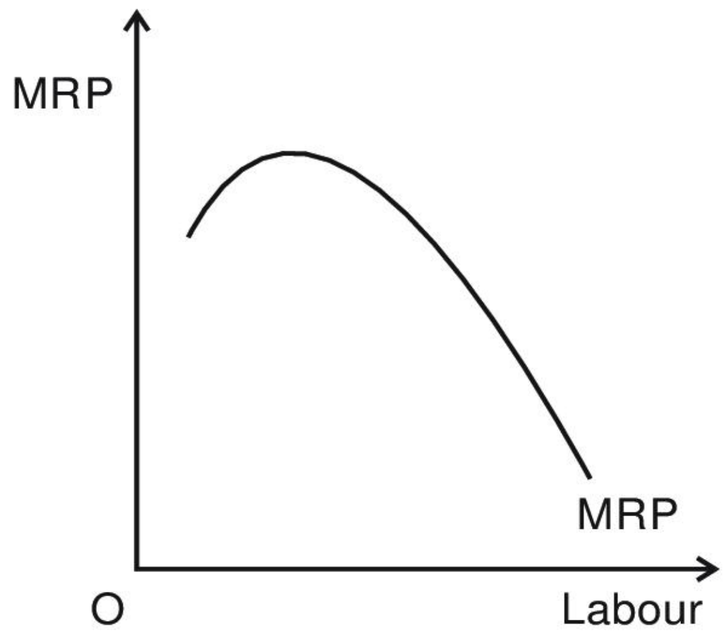
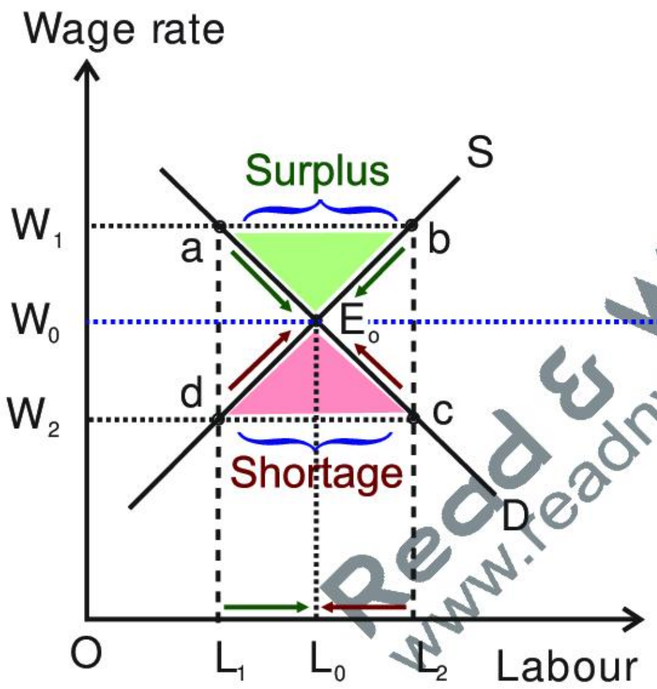


Wage determination in perfect market

Assumptions:

1. **Every one is a wage-taker:** The assumptions of perfect labour markets are similar to those of perfect goods markets. The main assumption is that everyone is a wage-taker. In other words, neither employers nor employees have any economic power to affect wage rates. This situation is not uncommon. Small employers are likely to have to pay the ongoing wage rate to their employees, especially where the employee is of a clear category, such as an electrician, a bar worker, a secretary, or a porter. As far as employees are concerned, being a wage-taker means not being a member of a union and therefore not being able to use collective bargaining to push up the wage rate.
2. **Freedom of entry:** There are no restrictions on the movement of labour; so, workers are free to move to alternative jobs or to areas of the country where wage rates are higher. There are no barriers erected by, say, unions, professional associations, or the government. Of course, it takes time for workers to change jobs and maybe to retrain. This assumption therefore applies only to the perfect labour market.
3. **Perfect Knowledge:** Workers are fully aware of what jobs are available at what wage rates and with what conditions of employment. Likewise, employers know what labour is available and how productive that labour is.
4. **Homogenous labour:** It is usually assumed that, in perfect markets, workers of a given category are identical in terms of productivity; e.g., it would be assumed that all bricklayers are equally skilled and motivated.
5. **The law of diminishing returns is applicable:** The law of diminishing returns applies to the market.
6. **Perfect competition in both product and labour markets:** Wage rates and employment under perfect competition are determined by the interaction of the market demand and supply of labour.

Wage rate determination in a perfectly competitive industry



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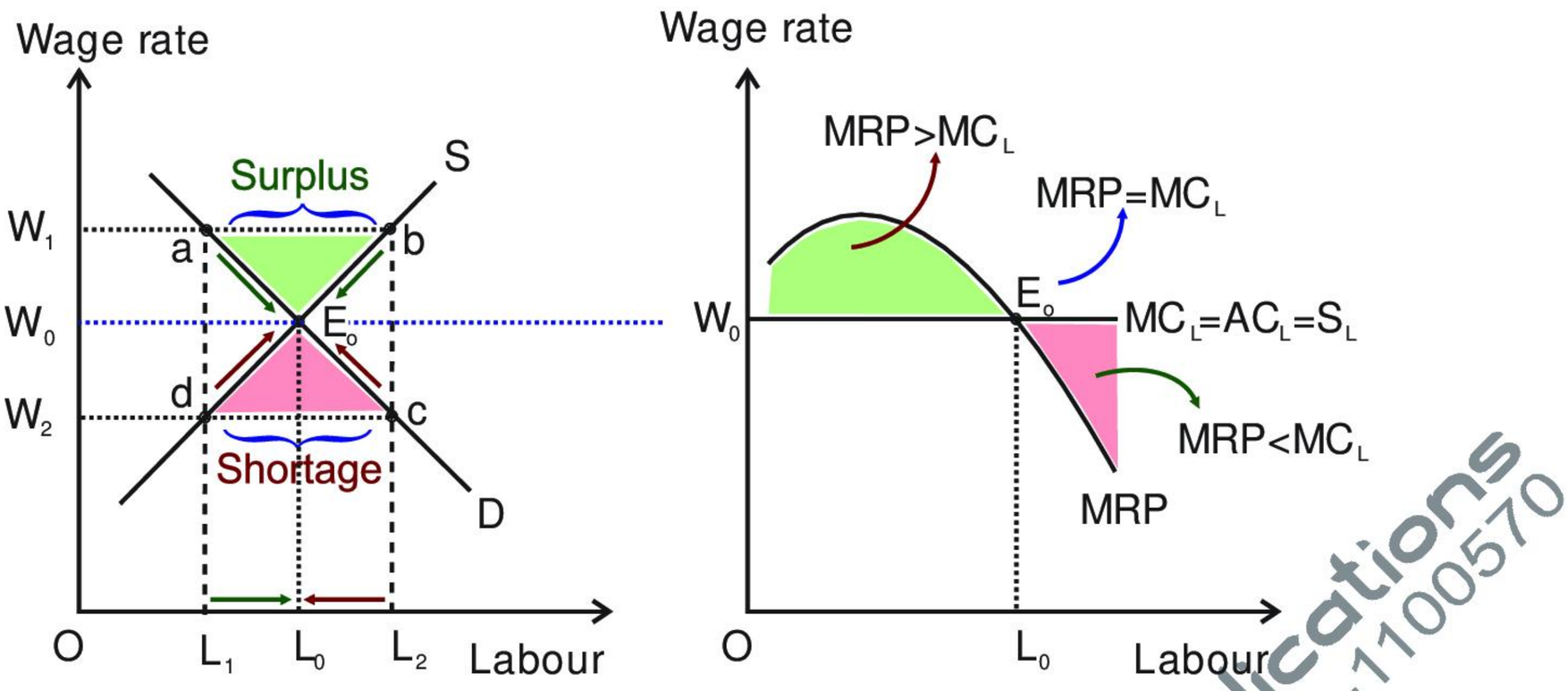
The above diagram shows wage determination in the case of a perfect labour market. The equilibrium wage rate is W_0, which is where demand is equal to supply.

If the wage is W_1 as shown in the above diagram, the supply of labour would be more than its demand, creating a surplus. In this situation a downward pressure on the wage rate will establish the equilibrium at W_o. Similarly, if the wage rate is at W_2, the demand for labour will be more than its supply, creating a shortage. An upward pressure will then restore equilibrium to W_0.

Wage rate determination in a perfectly competitive firm

How many workers should a firm employ in order to maximize profit?
The firm will answer this question by weighing up the costs of employing extra labour against its benefits. It will use exactly the same principles as in deciding how much output to produce.
In the goods market, the firm will maximize profits where the marginal cost of producing an extra unit of a good is equal to the marginal revenue from selling it (MC = MR).

In the labour market, the firm will maximize profits where the marginal cost of employing an extra worker equals the marginal revenue that the worker's output earns for the firm(MC of labour = MR of labour). The reasoning is simple: If an extra worker adds more to the firm's revenue than to its costs, the firm's profits will increase; it will be worth employing that worker. But, as more workers are employed, diminishing returns will set in. Each extra worker will produce less than the previous one, and, thus, earn less revenue for the firm. Eventually, the marginal revenue from extra workers will fall to the level of their marginal cost. At that point, the firm will stop employing extra workers. There are no additional profits to be gained. Profits are at a maximum.



Below L_0, the marginal revenue product is more than the marginal cost of labour. This means that the revenue being earned by the firm is more than the cost of employing that labour. The firm has a profit margin which can be absorbed by employing more labour, as extra labour will generate more profits. However, beyond L_o, the MC_L is more than the MRP, therefore it is more expensive to employ labour and doing so will reduce total profit. So, at L_0,the total profit made by the firm will be maximized and the firm will be in equilibrium.

Derivation of the firm's demand curve for labour

No matter what the wage rate, the quantity of labour demanded will be found from the intersection of W and MRP_L.

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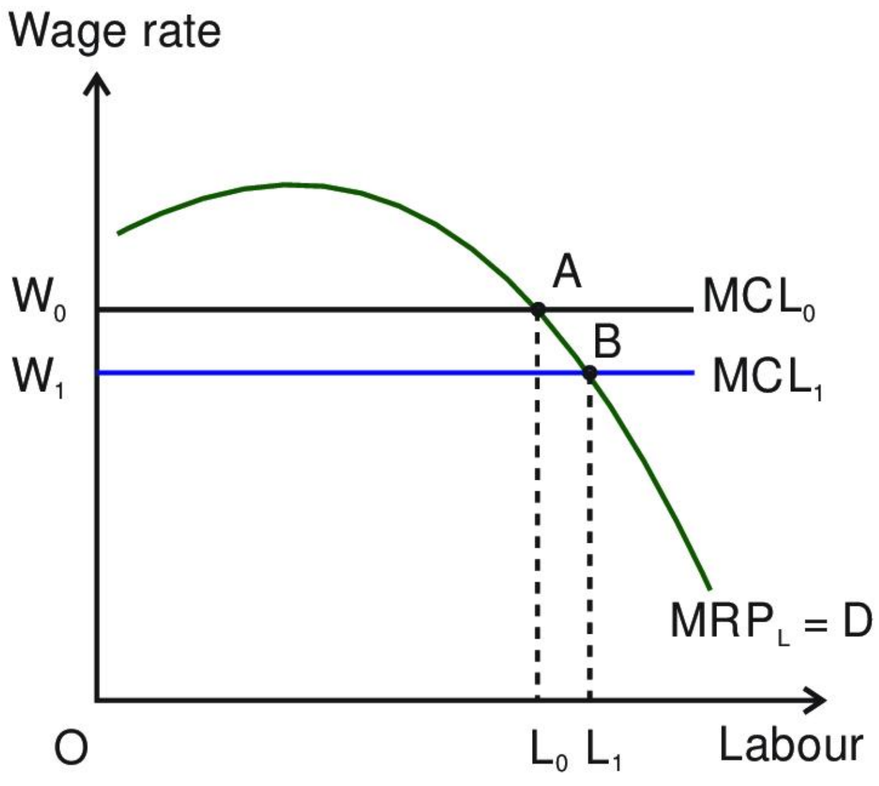

At wage rate W_0, L_0labor is demanded (point A); at W_1, L_1 is demanded (point B). Thus, the MRP_L curve shows the quantity of labour employed at each wage rate. Therefore, the MRP_L curve is also the demand for labour.

The limitations of MRP theory:

The marginal productivity theory of distribution has been one of the most criticized theories in economies due to it unrealistic assumptions.

1. **All units of a factor are not homogenous:** The assumption that all units of a factor service are homogenous is unrealistic. We know that the efficiency of labour differs from worker to worker. Similarly, one piece of land differs from the other in terms of soil fertility. It is, therefore, incorrect to assume that the different factor units of the same service are homogenous. In fact, heterogeneity is the norm. It follows that, since no two factor units are homogenous, they are non-substitutable for each other. A textile engineer cannot be employed in place of a sugar technologist.

2. **Factors are not perfectly mobile:** The theory assumes perfect mobility of factors as between different occupations and places. But, in reality, factors are mostly immobile. There is no automatic movement of factor units from one industry or place to another. The greater the degree of specialization in an industry, the less is the factor mobility from one industry to another. That is why factor units of the same service or even of different services are not paid equal to the value of the marginal products that they produce in every occupation and at all places.

3. **Perfect competition does not exist in the real world:** The theory is based on another unrealistic assumption: that perfect competition exists, when, in actuality, perfect competition is found neither in the factor market nor in the commodity market. Rather, imperfect competition or monopolistic competition is the rule which leads to the exploitation of the factors as they are paid much lower the value of their marginal products. Professor Chamberlin has, however, applied the marginal productivity theory to imperfect competition as well.

4. **Profit motive is not the main motive:** The theory assumes that entrepreneurs' main motive is to maximize profits, which is why more units of a factor service are employed when the firm finds the marginal revenue product of the services is higher than their prices. But, as pointed out by Schumpeter, entrepreneurial action is guided by the desire to found a commercial kingdom, the will to conquer, and the joy of creating and getting things done. It is, therefore, incorrect to say that entrepreneurs are guided solely by a profit motive.

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5. **Marginal revenue and marginal product cannot be calculated:** Marginal revenue is derived from average revenue or the demand curve of the product, which itself is derived on the basis of ceteris paribus assumptions that are not true in the real world. Therefore, it is very difficult to determine marginal revenue when demand is continuously changing.

The marginal product of labor cannot be identified in some industries, especially in the services sector, as many other factors apart from addition labour may have strong influences over output.

Conclusion

We can conclude that the marginal productivity theory is not an adequate explanation of the determination of the pricing of factor services. It simply states the demand side of factor-pricing and, therefore, is one-sided. It operates under the many restrictive assumptions of perfect competition and is, thus, unrealistic. It is static and takes for given that the price of a factor-unit must be equal to its marginal revenue product. Thus it fails to explain the determination of factor pricing in a dynamic economy.

Monopsony

In the real world, many firms have the power to influence wage rates—they are not wage-takers. This is one of the major types of labour market 'imperfections'.
When the firm is the **only employer** of a particular type of labour, it is known as amonopsony. The post office is a monopsony employer of postal workers. Another example is when a factory is the only employer of certain types of labour in that district. It, therefore, has local monopsony power. When there are just a few employers of a certain factor in the factor market, it is referred to as an oligopsony.

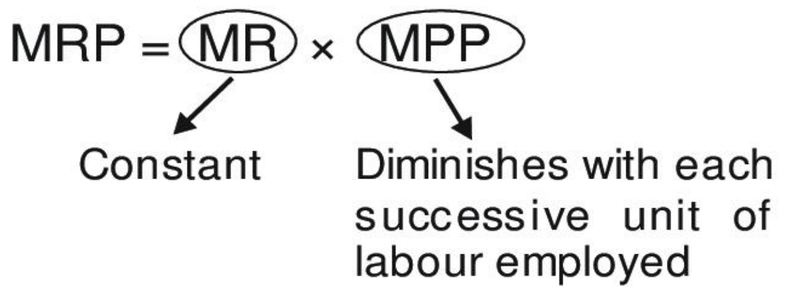
Monopsonists (and oligopsonists too) are 'wage setters,' not 'wage-takers'. Thus, a large employer in a small town may have considerable power to resist wage increases or even to force wage rates down.

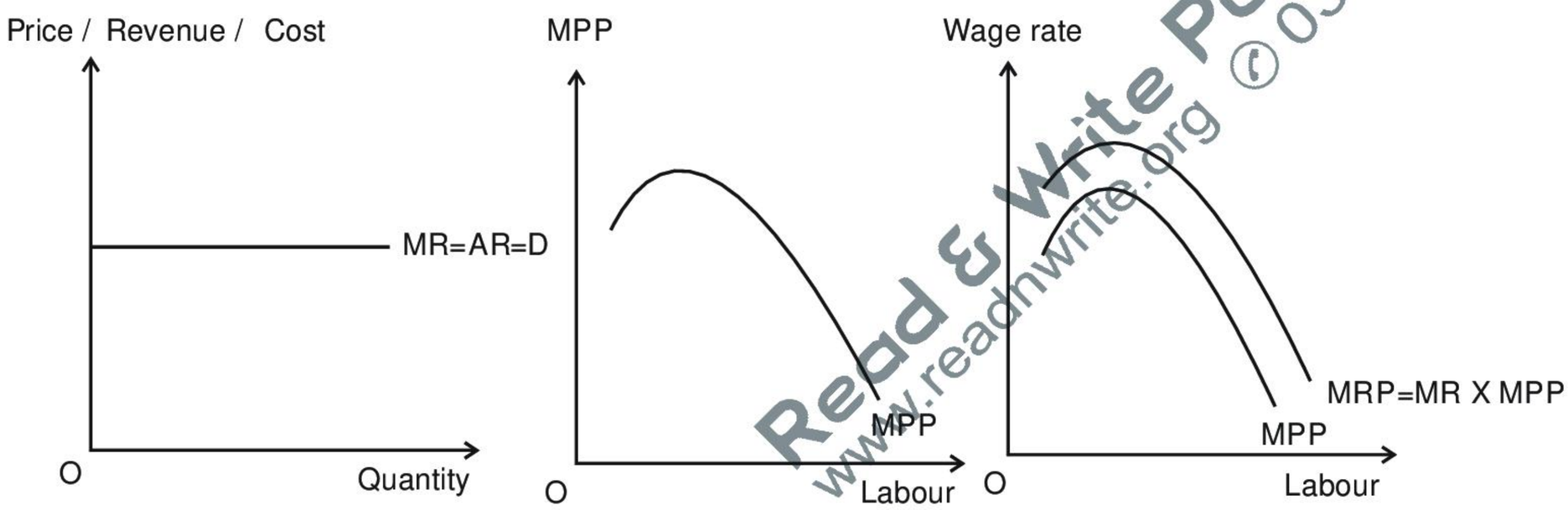
Demand for labor by a monopsony

The demand for labour by a monopsonist depends on the product market structure within which it operates. If a monopsonist is in a perfectly competitive product market and is a price-taker, then:

$$\text{Demand for labour} = MRP_L = P \times MPP$$

The MRP_Lcurve for a firm operating within a perfectly competitive product market will be downwardsloping because of the law of diminishing returns.





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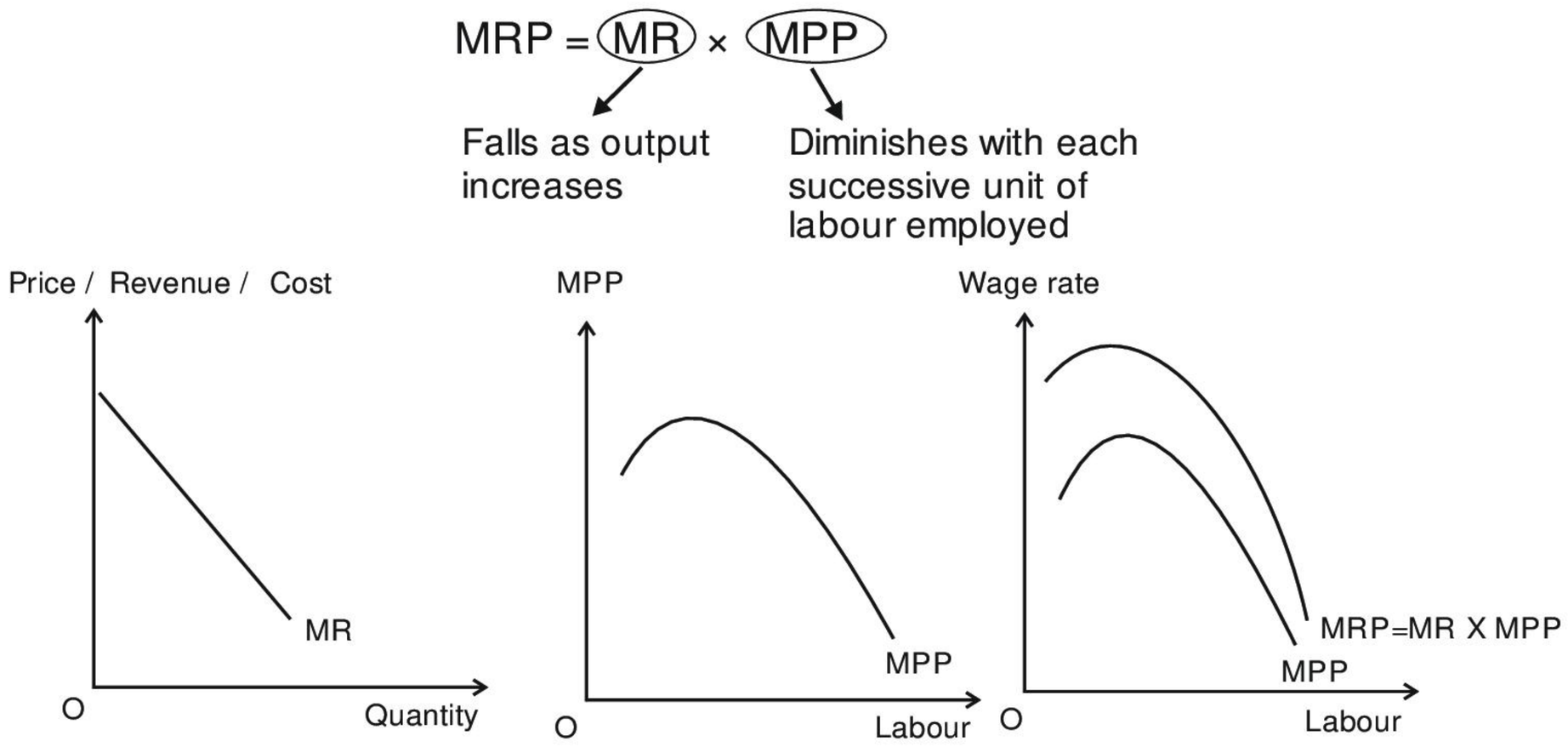
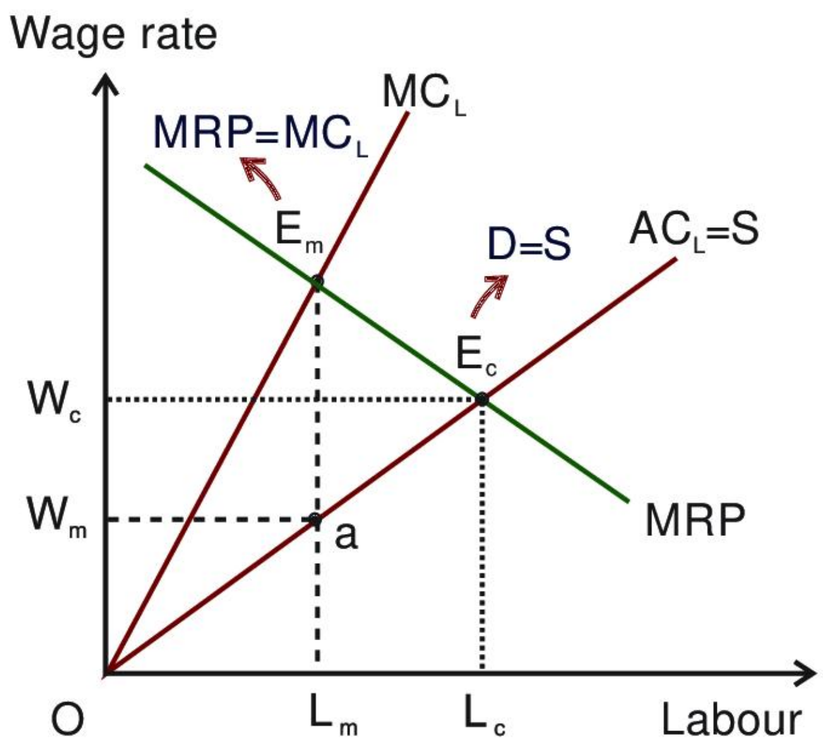
However, if a monopsonist is operating in imperfect competition in the product market (such as in monopolistic competition, an oligopoly, or in a monopoly), its MRP curve will slope downwards because of two reasons: (1) The law of diminishing returns to a variable factor and (2) the falling MR as output increases.
Under imperfect product market both the MR and AR curves are downward sloping, therefore:



In both cases, as a monoposonist employs more labour, its MRP falls.

Wage and employment determination in a monopsony



This profit-maximizing employment of labour would be at L_m, where $MC_L = MRP_L$. The wage (found from the AC_L curve) would thus be W_m.
If this had been a perfectly competitive labour market, employment would have been at a higher level L_c, with the wage rate at a higher level W_c, where $W = MRP_L$. What in effect the monopsonist is doing, therefore, the wage rate down by restricting the number of workers employed.

Trade Union

A trade union is an organization of workers who seek through collective bargaining with employers to protect their own interests.

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Within an organization, an individual worker is likely to be in a relatively weak bargaining position compared to his or her employer. Compared to an individual worker, the employer possesses far greater knowledge about everything, from safety standards to the profitability of the firm. Moreover, the loss of an individual worker is likely to be far less significant to a firm than to the employee who was made redundant. So workers have organized themselves in unions to bargain collectively. Instead of each individual worker bargaining with the firm on a wide range of wage and employment issues, workers elect or appoint their union leader.

Aims of the trade unions

1. **To demand higher wages for its members:** This is the main objective of the organization—to fight for higher wages, especially when the cost of living in an economy increases. Trade unions usually raise wage rates by setting a minimum wage limit in the market.

2. **To improve working conditions for employees:** An example of this could be improving the conditions of the workplace to ensure the safety and well-being of the employees. Another example is reducing the noise level at the workplace to ensure that the workers are provided comfort when working, and also to protect their hearing.

3. **To demand better perks:** Examples of perks include: paid examination leave, transport allowance, free annual medical check- ups, etc. In other words, the trade union ensures that employers give a higher priority to the welfare of workers.

4. **To provide recreational facilities for the employees:** Trade unions may have a building of their own, with facilities like swimming pools, tennis courts, sports, etc.

5. **To provide training courses for personal development:** Trade unions may conduct personal development and vocational courses, such as those in computer skills, basic cooking classes, and even parenting classes for married couples.

6. **To ensure that members' interests are also represented at the national level:** Trade unions may take part in national day parades, marathons, and other national events where their members' interests can be represented.

Unions facing competitive employers

If the employers are producing under perfect or monopolistic competition, unions can raise wage rates, but only at the expense of employment. Firms are only earning normal profit; thus, if unions force up wages, then some firms will go bankrupt and leave the industry. Fewer workers will be employed. The fall in output will lead to higher prices. This will enable the remaining firms to pay a higher wage rate.

The diagram below shows the impact of a trade union entering a perfect labour market. Initially, the wage determined was W_c. After the union influences the market it sets a minimum wage rate W_u. In this case, the demand for labour is less than supply, creating an excess supply of workers in the market, as shown by the distance $E_u a$, who will be wishing to work in this industry but will not be available to find jobs for themselves.

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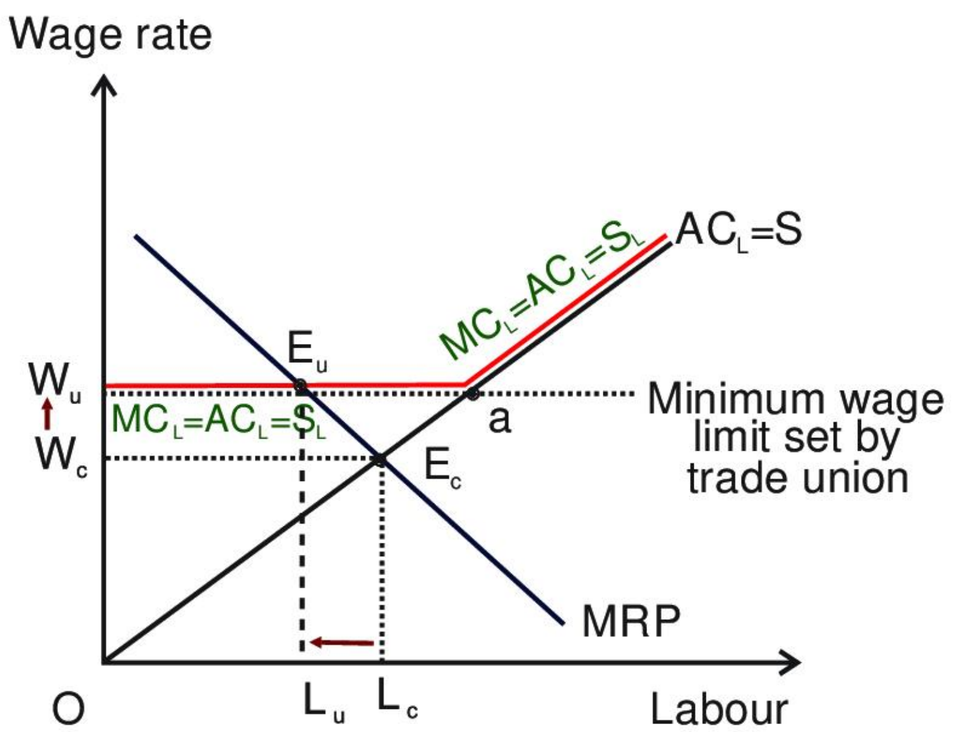


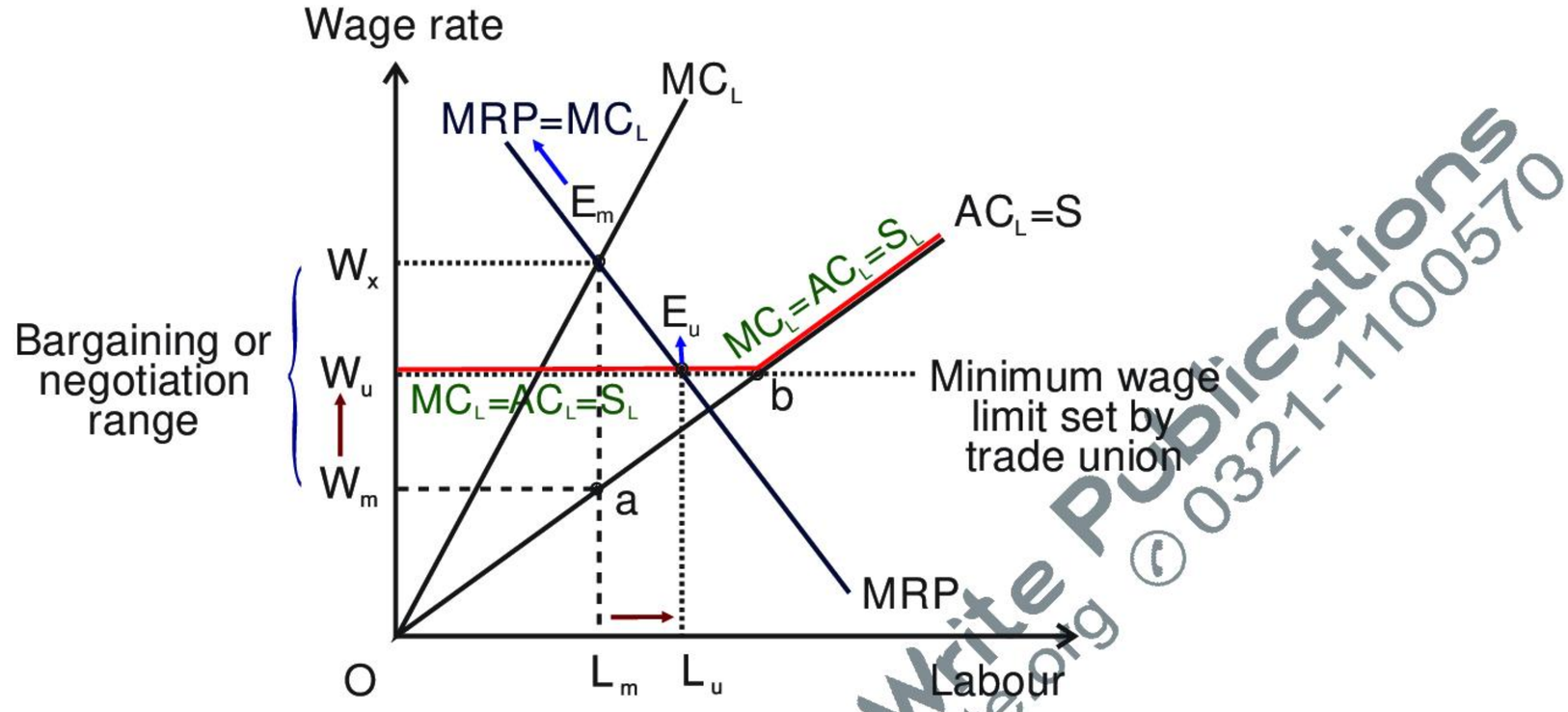
The union thus creates two disadvantages: It causes a loss of jobs because of pushing up the wage rate, and it is possible that the people who are unemployed might undercut the union wage (thereby causing union members to be made redundant in favor of the cheaper labour), unless the union can somehow prevent the firm from employing non-union members.

Wage rates can be increased without a reduction in the level of employment only if, as a part of the bargain, the productivity of labour is increased. This is called a **productivity deal**. The MRP curve (and hence the D curve) shifts to the right, which consequently will increase the number of workers employed.

In a competitive market, then, the union is faced with the choice between wages and jobs. Its actions will depend on its objectives.

Trade Unions vs. Monopsony Employers

Many trade unions operate in factor markets where there are monopsony employers. A sole seller of labour (the trade union) faces a sole buyer of labour (the monopsonist). Economic theory suggests that a trade union will increase both wages and employment compared to a factor market where a monopsony employer negotiates with a large number of individual employees. The figure as follows shows the wage and employment levels in an industry with a monopsonist and many individual employees.



The figure shows the entry of a trade union to the industry. Assume that the trade union forces the wage rate up to OW_u. This produces a kinked supply curve W_ubS. The monopsonist cannot pay a wage lower than OW_u because of its union agreement. However, it is free to pay higher wage rates if it wishes to employ more than OL_u workers. This produces a kink in the marginal cost of labour to the firm. Up to OL_u, the marginal cost of the labour (MC_L) is the same as the union negotiated wage rate (W_u). The employer can hire an extra unit of labour at that wage rate. If it employs more than OL_u workers, the wage rate will rise, resulting in $MC_L > AC_L=S_L$. The monopsonist has a profit incentive to hire extra workers so long as

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the marginal revenue product of labour, shown by the demand curve, is greater than the marginal cost of labour. Hence it will employ OL_u workers and will establish equilibrium at E_u.

What this means is that the union can push the wagerate right up from W_m to W_u and the firm will still want to employ L_u. In other words, a wage rise can be obtained without a reduction in employment.

Other reasons for deviation of wage rate from perfect markets

The government can also cause imperfections in the market by setting a minimum wage level, to improve living standards of less skilled workers. It could also set a wage cap for public sector workers, thus restricting wage from increasing from a certain level. The possession of power by unions and/or firms is not the only way in which real-world labour markets diverge from the perfectly competitive model. Workers or employers may have imperfect information. Wages may respond very slowly to changes in demand and supply, causing the disequilibrium in labour markets to persist.

Firms may not be aiming to maximize profits. Likewise workers may not seek to maximize their 'worker surplus'—the excess of benefits from working (i.e., wages) over the disutility of working (displeasure in doing the job and lost leisure). There may also be discrimination of wage rates on the basis of gender, color etc.

Efficiency of Trade Unions

Neo-classical economic theory suggests that trade unions operating in competitive industries reduce employment levels and raise wage rates. If all industries but one were perfectly competitive, then a trade union is that one industry would mean that economy as a whole was not Pareto efficient.

However, most industries in the real world are imperfectly competitive. A trade union facing a monopsonist will redress the balance of power in the industry and lead to a level of employment and a wage rate which is nearer to the free market price of labour. It could well be that the presence of a trade union increases economic efficiency in an imperfectly competitive market. Hence the effect of trade unions on economic efficiency depends on the structure of markets in an economy.

A further important argument needs to be considered. Some economists have suggested that trade unions raise economic efficiency because they lower costs of production to the firm. The trade unions perform many of the functions of a personnel department within a firm. It deals with workers' problems and obviates the need for the firm to negotiate pay with each and every worker. More importantly, it can be a good vehicle for negotiating changes in working practices. A firm may wish to implement changes which will lead to less pleasant working conditions for its workers. Perhaps it wishes to increase the speed of the assembly line or force workers to take a variety of tasks rather than just one. It may find it difficult to implement these changes on a non-unionized workforce because some workers may take unorganized industrial action or do their best to disrupt any changes being introduced. A union may help the firm to persuade workers that changes in working practices are in their own interest. The union will usually demand a price for this co-operation—higher wage rates for its members. But it still leads to an increase in economic efficiency because the firm is able to make higher profits whilst workers receive higher wage rates. According to this view, trade unions increase productivity in the economy.

The power of trade unions

The extent to which unions will succeed in pushing up wage rates depends on the power and militancy. It also depends on the power of the firms to resist, and on their ability to pay higher wages.
There is a variety of factors which make trade unions more or less powerful:

1. **The elasticity of demand for a firm's good:** If the demand for a firm's good is elastic, i.e., the change in the quantity demanded of a good is more than the change in its price, especially in the case of luxury goods, the trade union will be unsuccessful in demanding higher wages. Even if the producer lowers prices when the cost of production is reduced, the total revenue of the firm will still decrease due to the elastic demand for the product.

2. **The proportion of labour cost out of the total cost of production:** If labour cost is a major portion of total cost of production, the trade union will be unsuccessful in demanding higher wages as increase in wages will increase cost of production. Profits will be reduced when costs increase.

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3. **Size, membership, and leadership of the trade union itself:** If the trade union is weak with a small membership and the leaders do not have the support of the members, it will be more difficult for the leaders to demand for higher wages.

4. **Economic conditions:** If the prevailing economic condition is poor, i.e., the economy is declining and economic growth is slow or negative, it will be more difficult for the trade union to demand higher wages.

5. **Availability of substitutes:** If labour can be substituted easily with capital or machinery for a particular job, the trade union will be less successful in demanding higher wages.

6. **Profitability of the employer:** A trade union is unlikely to be able to negotiate large wage increases with an employer on the verge of bankruptcy. It is likely to be in a stronger position with a highly profitable firm. This implies that trade unions will be stronger in monopolistic and oligopolistic industries, where firms are able to earn abnormal profit, than in perfectly competitive industries where only normal profit can be earned in the long-run.

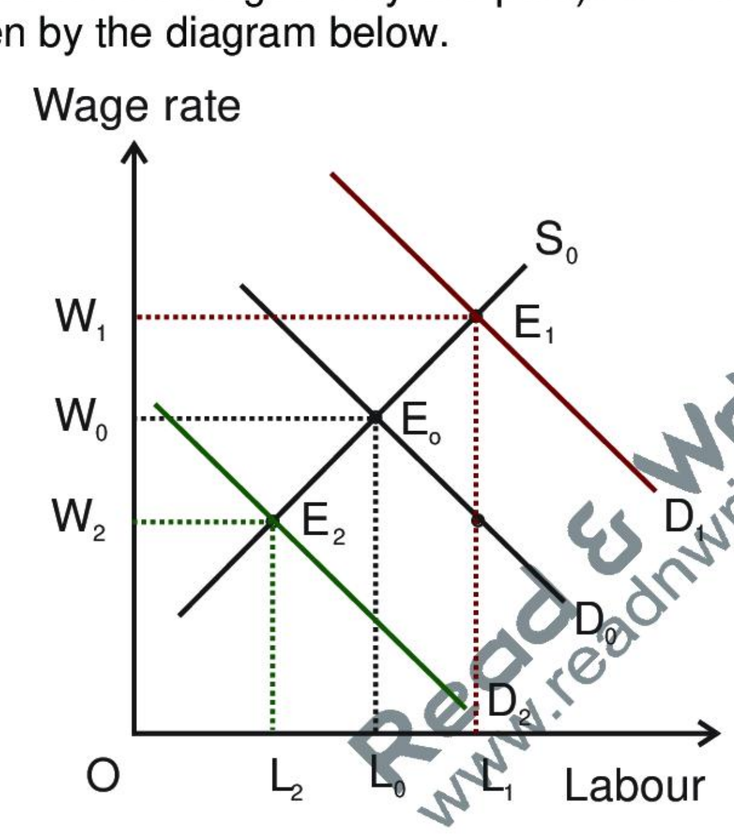
7. **Militancy:** Unions are more likely to call for industrial actions if union members are militant. The more militant the union membership, the more costly a dispute is likely to be for an employer

Wage differentials

Wage differentiates are defined as the differences in wages received by different people. There may be many reasons that cause these differences. Wage differentiates may exists due to demand side seasons, supply side reasons, market imperfections, government laws, and discrimination.

1. Demand-side reasons:

The demand for labour is determined by the marginal revenue product theory. The MRP is the revenue earned by the firm by employing an extra unit of labour. It is found by multiplying the marginal revenue with the marginal physical product. Marginal revenue is the value of the product. MPP is the marginal physical product productivity of labour. The demand for labour can be changed due to various factors. The productivity of labour (MPP). The productivity of labour or the MPP may also affect the demand. The more productive is labour, the more of it will be demanded. The demand for the product also affects the demand for labour. The higher the market demand for the good, the higher will be its market price, and hence the higher will be MR, and thus the MRP. This to determine the position of the demand curve. It shows how the demand for labour (and other factors) is a derived demand (i.e., one derived from the demand for the good, such as the higher the demand for houses, the higher their price, the higher will be demand for bricklayers and the better the wages they are paid).All of these factors will shift the demand curve for labour. This can be seen by the diagram below.



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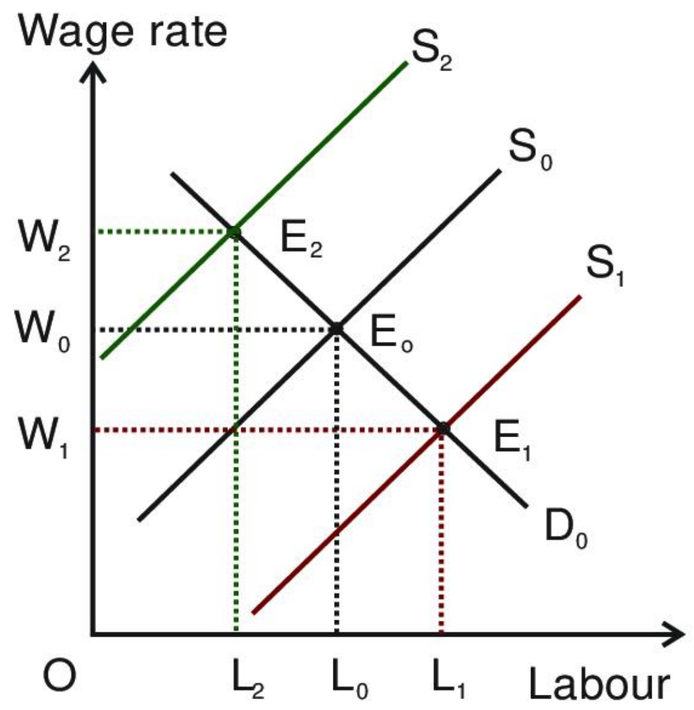
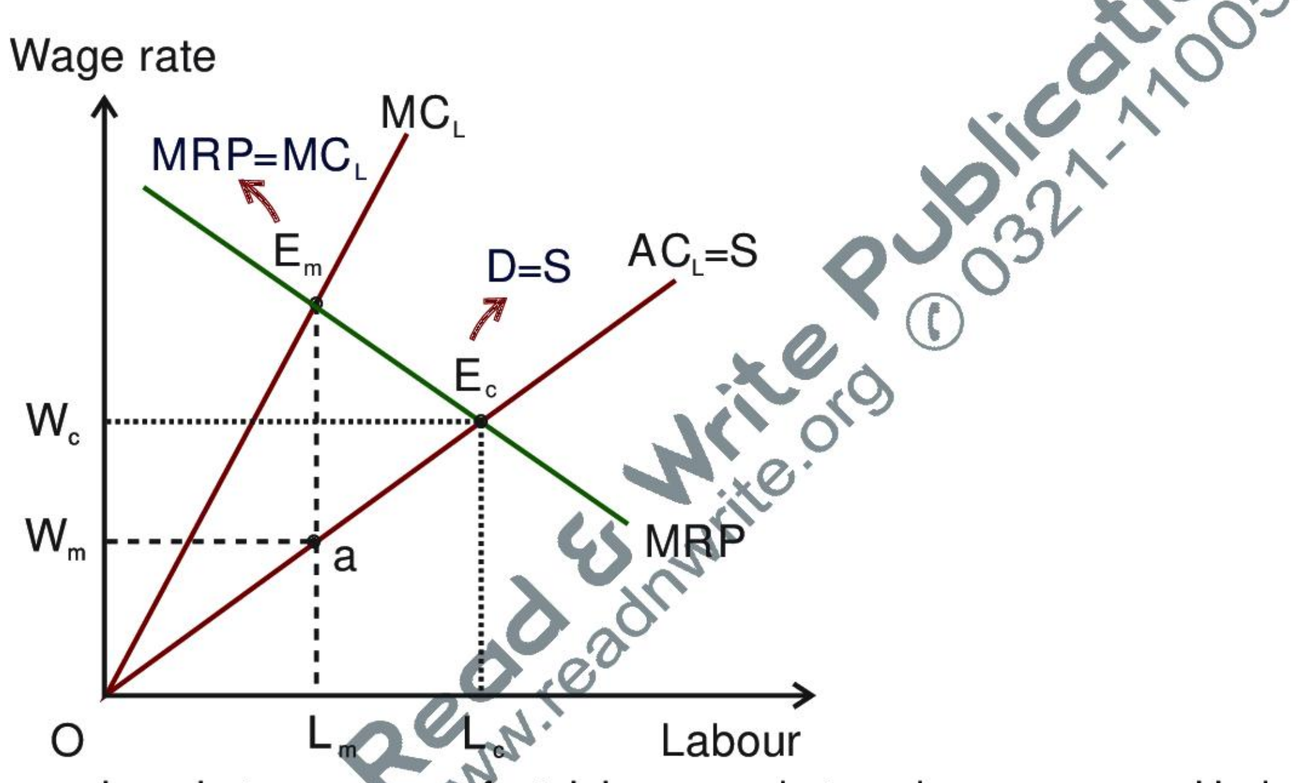
2. Supply-side reasons:

The supply side reasons can also bring above changes in the wage rate by shifting the equilibrium position of the wage rate set by market forces. The more the number of qualified people there will be in a market, the more will be the supply of labour. The more the non-wage benefits will be offered for a job more people would want to take up the job and vise versa. These non-wage benefits include holiday entitlement, perks, health, transport, insurance, better working conditions, etc. The more there is job security within a job the more will be the supply of labour; for example, instruction work athletes have greater changes of being laid off and have less job security as compared to a university teacher. It also depends on the cost of training: The longer a person has to study to acquire a degree in a profession, the more money he will have to spend, thus the supply of such people in the job market will reduce. Examples can be of Doctors/dentists vs. accountants. Biological differences can causes differences in the marginal productivity of labour, thereby changing its supply. Not every human is equally skilled—some may have an aptitude for medicine while others may be interested in art. Also, within the same occupation every person may not be equality efficient/responsible/innovative as the other person. The experience of a person may also affect the supply of labour—the more experienced a person is the more chances more are for him/her to be hired. All of these supply side reasons will cause the wage rate to shift. This can be shown by the diagram below.



3. Market Imperfections:

Market imperfections may also result in wage differentials. Generally speaking, the market comprised of perfect and imperfect markets. Wages are determined at a different position in perfect market as compared to an imperfect market such as a monopsony (single buyer of labour). This can be observed in the diagram below.



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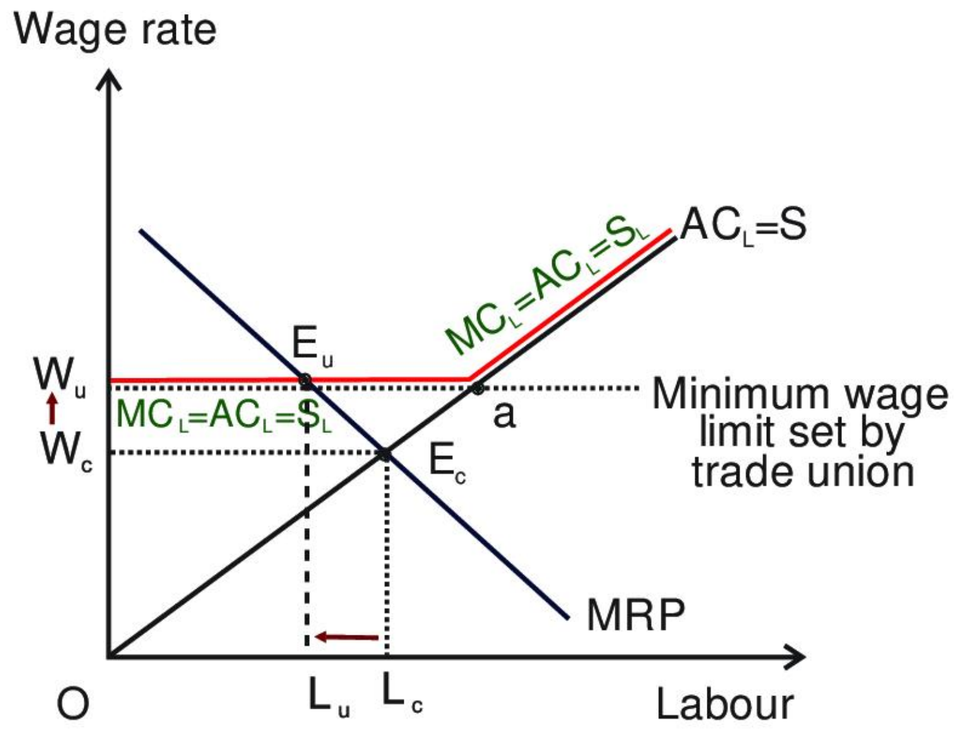
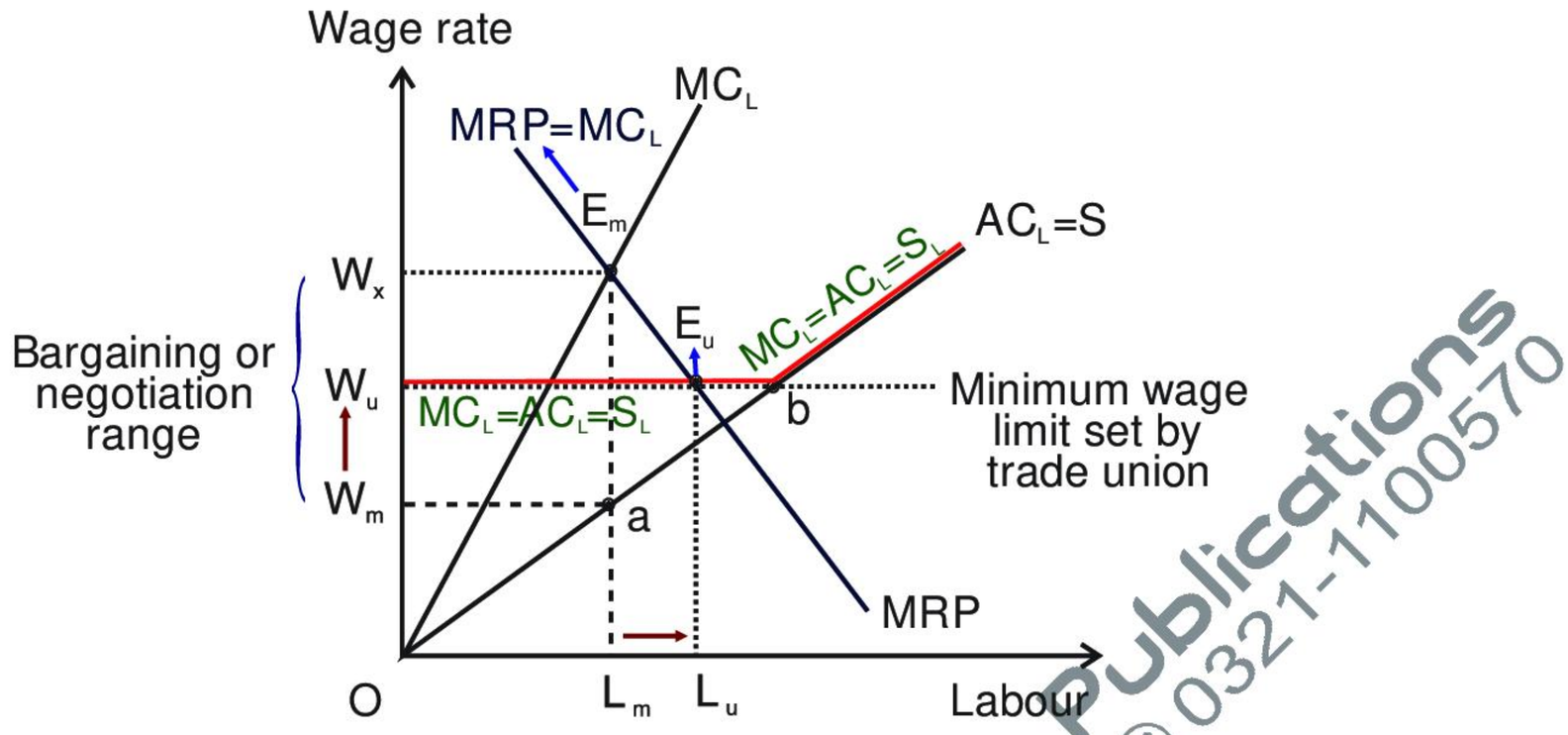
The diagram above shows a comparison between a perfect labour market and monopsony. Under a perfect labour market the wage rate is W_c and the quantity of labour is L_c. This is the point where the MRP

intersects with the supply curve. In an imperfect market or monopsony the wage rate is at W_m and the employment at L_m. Thus the monopsony not only offers a lower wage rate (W_m) as compared to that of a perfect labour market (W_c), but it also the restricts the employment of labour to L_m.

Wage differentials may also be caused by trade unions when they enter a perfectly competitive market or an imperfect market. The difference in the wage fluctuations in the two markets will be different because of different demand-supply curves. The effect of a trade union in a perfect market is shown in the diagram below.



The diagram shows the entrance of a trade union in a perfect market. Initially, the wage rate is at W_c, where the market forces intersected with other. But due to the trade union a higher wage rate has been set at W_u; this is the minimum wage rate set by the trade union—the firm cannot offer less than the negotiated wage rate, but they can offer more. Similarly, trade unions can also cause wage differentials in an imperfect market, as shown in the diagram below.



The diagram shows the entrance of a trade union under imperfect competition (monopsony). Initially, the equilibrium was established at W_m where the quantity was L_m. But in this case the trade union has not only pushed up the wage rate but has also increased the number of people employed. The wage rate set by a trade union is higher than monopsony thus leading to wage differential.

4. Government regulations:

Wage differentials in the market may also be due to government regulations. The government might set a minimum wage so that monopsonist employers cannot exploit people and offer low wage rates. Certain laws can be imposed by the government, such as the minimum wage, which is entitled to those who are above 27 years old. Hence, the wages of those who are above 27 will be higher than those who are below 27, leading to wage differentials.

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5. Wage discrimination:

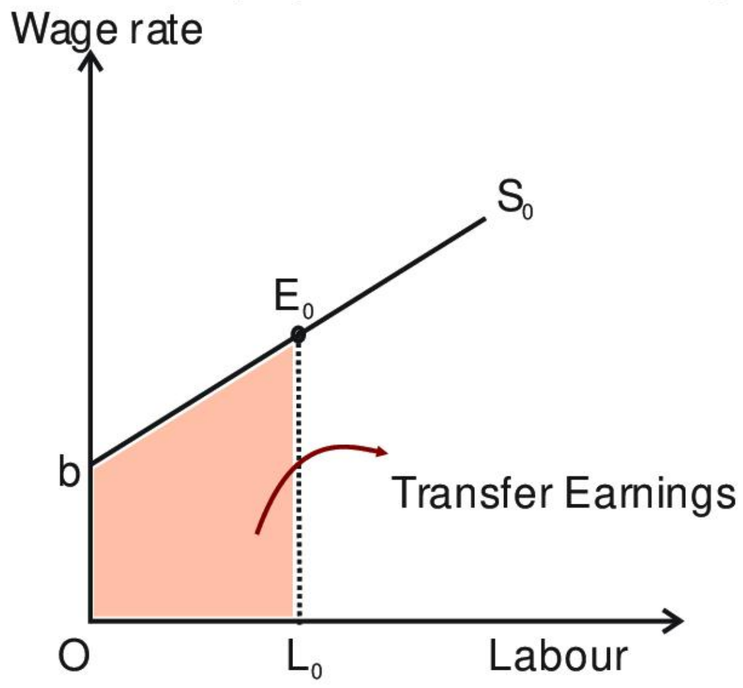
Lastly, wage differentials may be due to discrimination. The whites way be paid more than the blacks, women may be paid less than men, Asians may be paid less than Europeans, etc.
Therefore, there are a number of reasons that lead to the existence of wage differentials.

Transfer Earnings& Economic Rent

The theory of economic rent distinguishes between two elements in the payment made to a factor of production.

Transfer Earnings (TE):

- The transfer earnings of a factor are the minimum payment needed to keep the factor in its present use. If a worker is paid $200 a week, but could only earn $150 a week in her best paid occupation, then her transfer earnings would be $150 per week. Transfer earnings are the opportunity cost of employing the factor. A change in transfer earnings will affect the allocation of resources. If the worker could now earn $250 a week in their next best paid occupation, economic theory would predict that all other things being equal they would leave their present $200 a week job and take the job that pays higher.
- Height of supply curve of a factor of production will show the value of transfer earnings at a given unit of employment, and the area below the supply curve will indicate total transfer earnings for given units of factor of production employed, as shown in the figure below.

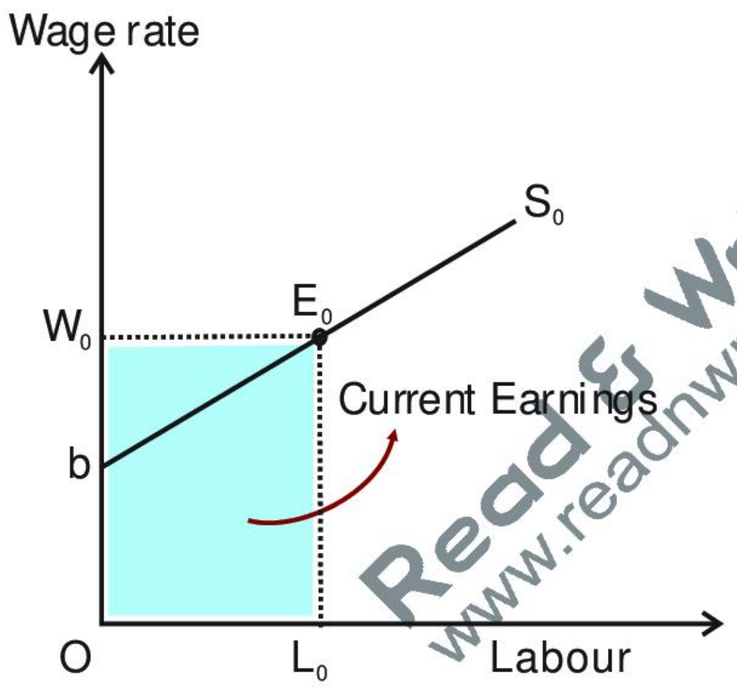


Current Earnings (CE):

Current earnings means whatever a worker is earning at a given wage rate for certain units of labour.

$$\text{Current earnings} = \text{wage rate} \times \text{labour}$$

Current earnings can be shown by the following diagram:



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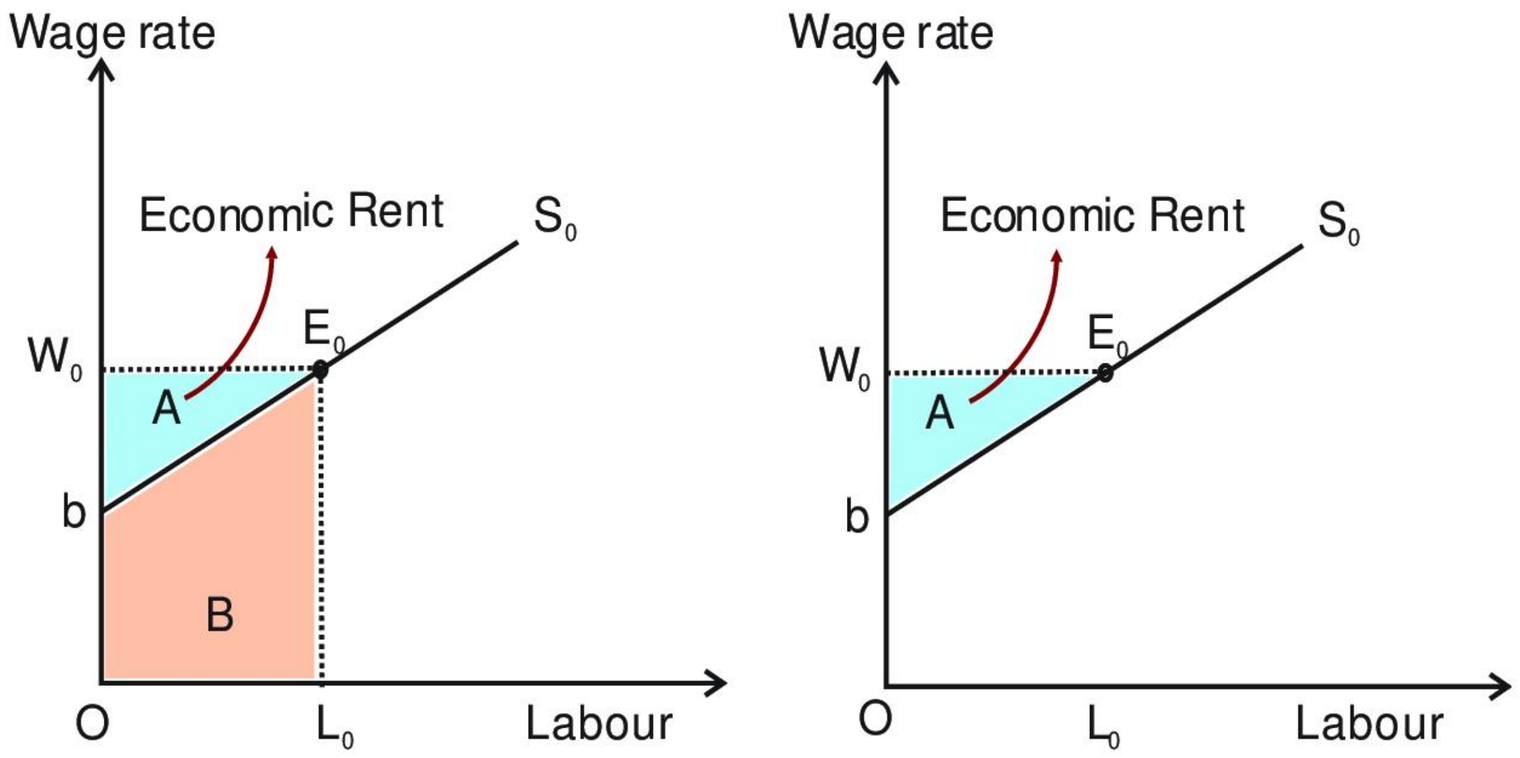
Economic Rent (ER):

- The economic rent of the factor. Economic rent is the payment over and above the minimum needed to keep the factor in its present use (i.e., it is the difference between its current earnings and its transfer earnings).
  Economic rent = Current earnings – Transfer earnings

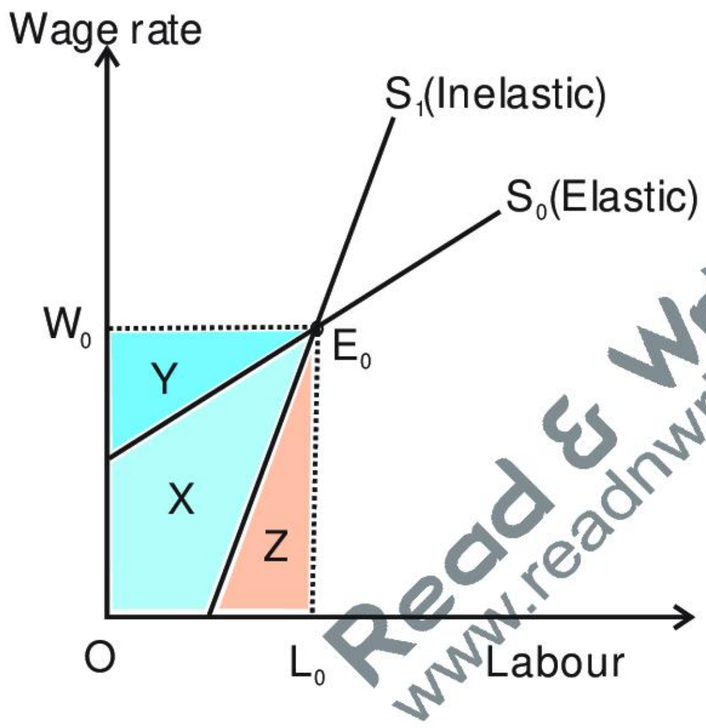
- Economic rent will not affect the allocation of resources. If the transfer earnings of a worker were $150, she would remain in her present job whether she earned $200 or $250 per week.
- Economic rent is the area between wage rate and supply curve ash shown in the diagram below:



The theory of economic rent can be explained using the demand and supply diagram. In the figure above, the equilibrium wage rate of labour is OW_0. Supply curve shows the minimum wage rate for which workers would be prepared to work. As successive workers are employed, the transfer earnings of the marginal worker (the last worker employed) increase. Total transfer earnings of all the workers employedis the area B.

The total earnings of OL_0 workers is the area AB (total number of workers OL_0 times the wage rate per worker OW_0). The difference between the total payment to a factor and its transfer earnings is its economic rent. Hence the economic rent of labour in the figure is the area A.

Economic rent will be greater the more inelastic the supply curve. Economic rent will be area Y if supply is elastic (S_0) and XY if it is inelastic (S_1) as shown in the figure below:



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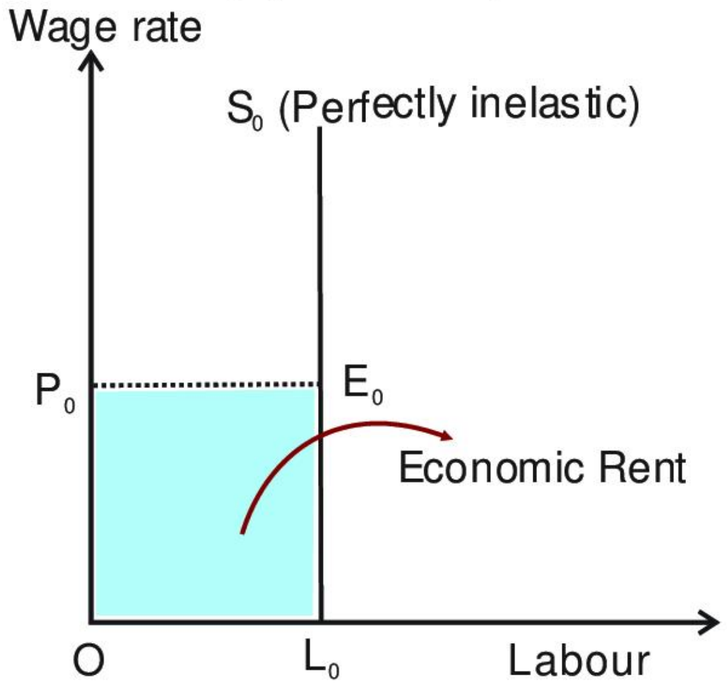
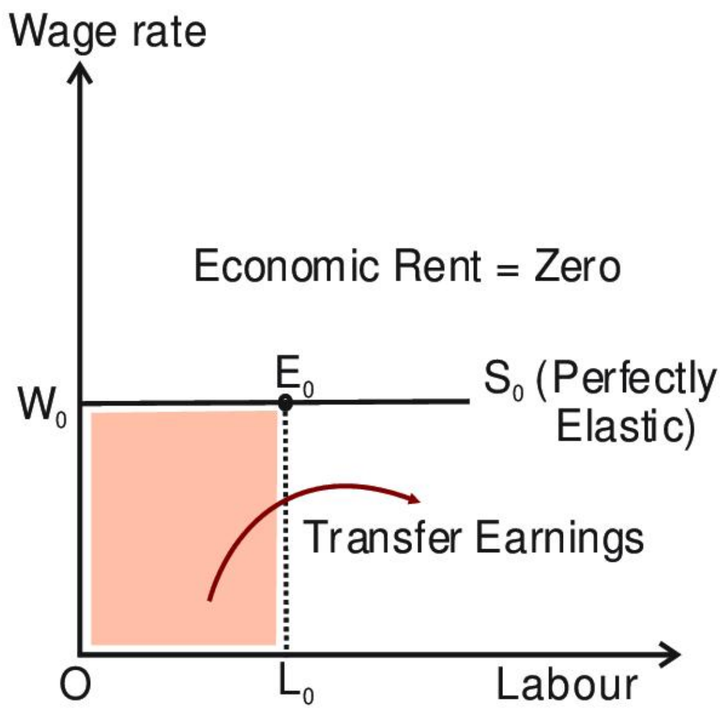
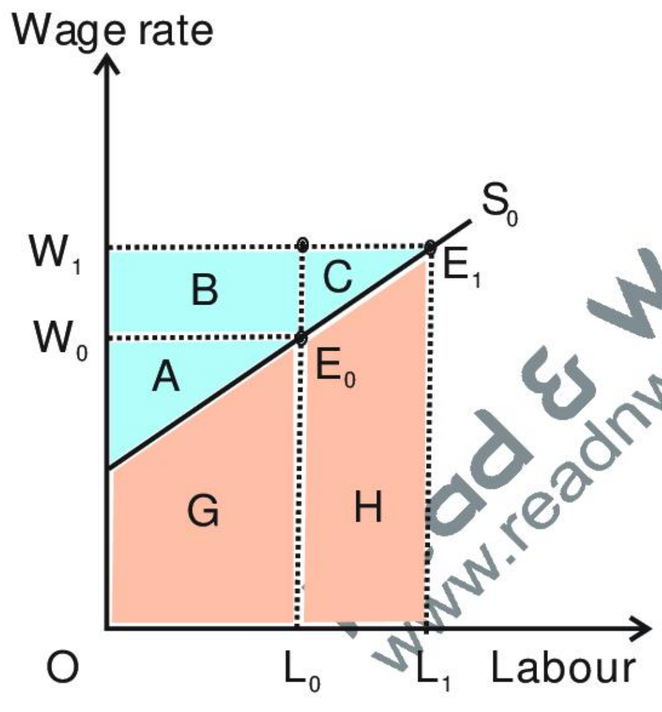
If, as in the figure below, supply is perfectly inelastic, then all the factor payment is economic rent and the transfer earnings of the factor is zero. The transfer earnings are zero because the factor will be supplied whether the payment received is zero or infinity (as shown by the vertical supply curve).



Similarly, if supply is perfectly elastic (i.e., the supply curve is horizontal), all the factor payment is transfer earnings and economic rent is zero. Whatever quantity bought, a higher price would result in demand for the factor falling to zero. The factor cannot earn anymore than the minimum needed to keep it in its present use.



Economic rent and transfer earnings both will increase with the increase in wage rate as shown in the diagram below:



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Quasi-rent

Sometimes, economic rent can be earned in the short-run, but not in the long run. Economic rent which can only be earned in the short run is called Quasi-rent. For instance, a firm may buy a piece of machinery which is so specialized that it has no alternative uses. Then its transfer earnings are zero and hence all the payments received from the use of the machine are quasi-economic rents. In the long-run, the machinery must be replaced completely or not at all, and hence part and all the earnings of this piece of capital will be transfer earnings. In the long run the machine will need at least to cover its economic cost or it will not be replaced.

Past Paper Questions

Topic : MRP theory & limitations

(Nov 2014/P43/Q4/a)
Explain what economists mean when they say that the labour market is imperfect rather than perfect. [12]

(Nov 2014/P43/Q4/b)
Does the use of the term 'imperfect' mean that there is some failure in the labour market that should be corrected by government intervention? [13]

(June 2014/P43/Q4/a)
Explain how a profit-maximizing firm will choose the quantity of labour it employs. [12]

(Nov 2014/P41/Q4/a)
Employment is likely to decrease if wages fall.
Employment is likely to decrease if wages rise.
Consider whether these apparently contradictory statements are true in the analysis of the demand for and supply of labour. [12]

(Nov 2014/P41/Q4/b)
Discuss how wage rates might differ between a perfect and an imperfectly competitive market for labour.[13]

(June 2014/P41/Q4/a)
Explain how a profit-maximizing firm will choose the quantity of labour it employs. [12]

(June 2014/P42/Q4/b)
It is argued that the wage determination in imperfect markets leads to exploitation. It is therefore necessary and beneficial if the government intervenes in the determination of wage rates. Discuss whether there is any truth in this argument. [13]

(November 2013/P41/Q3)
The economic theory of wages can explain wage determination in a perfect market. This, however, is of little use as all markets are imperfect and the theory has no relevance in such markets.
Discuss whether you agree with this statement. [25]

(June 2013/P41/Q3/a)
Explain how the quantity of labour employed and the wage rate are determined by a firm in a perfectly competitive labour market. [12]

(June 2011/P42/Q5)
In imperfect competition, labour markets can lead to worker exploitation in terms of the wage rates they receive compared with wage rates in perfect competition. Discuss this opinion. [25]

(June 2011/P41/Q4)
Do you agree that the wage of labour is determined by the market like any other price? [25]

(Nov 2010/P41/Q4/a)
Recently, employers in some countries have employed foreign workers instead of local workers. The local workers argue that they should have priority over foreign workers and also that more products should be produced at home rather than being imported.
Explain, with the help of a marginal revenue productivity diagram, why an employer might prefer to switch to foreign workers. [12]

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(June 2010/P42/Q4/b)
A government stated that pay increases in the coming year should be kept to a minimum. Discuss whether the main determinants of wage rates are factors such as trade unions and the government rather than market forces. [15]

(June 2010/P41/Q4)
The level of wage rates is not satisfactorily explained by economic theory because that theory concentrates on perfect competition while most labour markets are imperfect. Discuss whether this claim is true. [25]

(Nov 2009/P42/Q3)
By 2007, the telecommunications business had become dominated by fewer organisations. One of them, Cable and Wireless, announced there would be 3000 job losses. Another, Tiscali, announced 800 job losses and BT, the UK telecoms giant, announced a £450m major investment and restructuring resulting in thousands of job cuts. Analyse whether the above is what marginal revenue product theory predicts will happen when a labour market becomes less competitive and large investment takes place. [25]

(Nov 2008//P4/Q5)
The economic theory of wages assumes first that there is a perfect market and secondly that the market will reach a stable equilibrium. It therefore has little relevance to a commercial world full of change and uncertainty. Discuss whether you agree with this opinion. [25]

(June 2007/P4/Q3/a)
Explain how the analysis of wage determination in perfect competition leads to an equilibrium. [12]

(June 2006/P4/Q7/a)
Explain whether there is a link between the marginal revenue product of labour and the wage rate an occupation. [10]

(June 2005/P4/Q2/)
Economic theory often produces a definite outcome but in reality events are much less certain.
(a) Explain the economic theory of wage determination in perfect competition. [12]
(b) Discuss whether this theory is useful in explaining how wages are determined in reality. [13]

(June 2002)
(a) Explain how wage rates are determined in a perfect competitive market. [10]
(b) Discuss why wage rates might be different in practice from those in a perfect competitive market. [15]

(Nov 1999)
(a) Outline how marginal revenue productivity theory explains wage determination.[12]
(b) How realistic is this theory of wage determination in practice?[13]

(Nov 1995)
Discuss whether wages are determined by marginal revenue product. [25]

(June 1994)
(a) Explain how marginal revenue productivity theory can be used to analyse the equilibrium level of wages and employment in an industry where there is no trade union.[15]

(Nov 1993)
(a) Outline how the marginal revenue productivity theory suggests that the level of wages in an industry is determined. [13]
(b) How realistic do you consider this explanation to be?[12]

(June1993)
(a) Explain the marginal revenue productivity theory of the demand for labour in an industry.[10]

(Nov 1990)
(a) What is the marginal revenue product of a factor of production? [08]
(b) Analyse the likely causes of an increase in the marginal revenue productivity of a lorry drive. [08]
(c) Explain the likely consequences for the earnings of lorry drivers of an increase in their marginal revenue productivity. [09]

Topic : WAGE DIFFERENTIALS

(Nov 2014/P42/Q4/a)
Use economic analysis to help explain why there can be wide differences in wage rates. [12]

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(June 2014/P42/Q4/a)
Some top executives and some sports people are paid very high salaries. It is argued that this is inevitable as people are paid the market rate for the job. Use economic analysis to support this opinion. [12]

(June 2013/P41/Q3/b)
Discuss why wage rates might be different in practice from those in a perfectly competitive labour market.[13]

(Nov 2012/P43/Q4)
The economic analysis of wage determination states that all wages rates in different occupations will in the long run become the same and equal to the average product of labour. Discuss this statement. [25]

(Nov 2012/P42/Q4)
Some workers producing non-essential luxury goods or services are paid very highly. The wage rate is not related to the economic value of a good or service but more to social factors or fashion. The economic theory of wages is, therefore, of little use in explaining wage differentials. Assess this argument. [25]

(Nov 2012/P41/Q4)
The differences in wage rates paid in different occupations are caused entirely by the differences in the elasticity of supply of labour. The way, therefore, to overcome the differences in wage rates is to increase the training available to workers.
Discuss whether economic analysis supports this argument. [25]

(Nov 2010/P43/Q4)
Do you agree that the higher wages paid in some occupations occur just because some trade unions have a stronger bargaining position than others? [25]

(Nov 2009/41/Q4/)
Workers in the public sector are sometimes paid less than workers in the private sector. Discuss why wage rates differ.[25]

(June 2009/P4/Q3)
Discuss what might cause inequalities in wage rates in an economy. [25]

(June 2004/P4/Q4)
In 2002 in the UK public sector fire-fighters threatened to go on strike because they stated that their earnings were very low compared with other workers. In the same year Robbie Williams, a singer from the UK, signed the largest ever recording deal in the music industry worth millions of pounds.
Discuss whether the economic theory of wages can explain how workers in a vital industry such as the fire-fighting service can have lower pay than workers in a loss vital industry such as entertainment.[25]

(Nov 2003/P4/Q3/b)
In some economies in 2001 there was a decline in the number of people travelling by air. Unemployment increased as many people lost their jobs in hotels, airline companies and tourist related industries. Similar jobs in other industries were advertised at reduced wage rates.
Discuss how far economic analysis is of use in explaining the change in wage rates mentioned above. [15]

(June 2003/P4/Q3)
Between 1995 and 2000 there was a change in work patterns in maturities. Fewer people worked in agriculture and fisheries as the country diversified away from its staple crop, sugar, and more worked in restaurants and hotels as the tourist industry increased. However, in 2000 the government stated that the economy still suffered from an inadequately trained workforce with a lack of skills.
How far can the economic theory of wages explain the implications of this situation for the wages of an agricultural labour and a hotel manager? [25]

(Nov 2001)
How far can differences, in labour productivity explain differences in wage rates? [25]

(Nov 2000)
Can economic analysis explain differentials in wages? [25]

(June 2001)
Analyse why there are inequalities in wage rates in an economy. [25]

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(June 2000/a)
Why are the wages and salaries of some workers higher than others? [15]
(June 1999)
To what extent are differences in pay explained by differences in productivity? [25]
(Nov 1998)
Discuss why wages differ between occupations. [25]
(June 1998/a)
What economic forces explain why some workers recive low wage. [13]
(June 1997)
Can economic analysis explain why wages differ between occupations and within the same occupation. [25]
(Nov 1994)
If often seems that the highest pay is given to occupations that are most agreeable, such as senior civil servants and university lectures, while those occupation that are most unpleasant, such as road sweeping and rubbish collection, receive low pay.
Discuss the extent to which economic analyses support this view. [25]
(June 1992)
Some occupations, such a nursing, are vital but are paid very little. Others such as financial advisers are not so vital but are very highly paid. How far can economic theory explain this situation?
(Nov 1991)
Women, on average are paid a lower hourly wage rate than men. What economic reasons are there for this disparity?
(June 1991)
'Low pay is related directly to low productivity.' Discuss.
(June 1990)
Why do some people earn low wages?

Topic : Role of TRADE UNIONS

(Nov 2014/P42/Q4/b)
Discuss how this analysis could be adapted if a trade union intervened in the process of wage determination.[13]
(June 2008/P4/Q3)
In some countries the power of trade unions has decreased. In other countries, trade unions have organised major strikes resulting in employees refusing to work.
(a) Is the existence of a trade union likely to be the main factor that affects the supply of labour? [10]
(b) Discuss how the theory of wage determination through market forces might need to be altered when trade unions exist in an industry.[15]
(June 2007/P4/Q3/b)
Discuss how governments and trade unions can affect the equilibrium in a labour market. [13]
(Nov 2005/P4/Q3)
In some countries the power of trade unions has been restricted and the government has passed legislation fixing the minimum level of wage rates.
(a) Explain how trade unions can be incorporated into the economic analysis of wage determination. [12]
(b) Discuss the possible effects that trade unions might have on the economy of a country. [13]
(Nov 2004/P4/Q4/b)
In 2002 an electrical goods company in the UK that uses mass production techniques made many people redundant. It said that there had been meetings with the trade union but that it was moving its production to Eastern Europe and would transport the products from there.
How far does this decision indicate that trade unions have very little influence over wages and employment? [13]
(Nov 1992)
Do you agree that the higher wages paid in some occupation occur solely because some trade unions have a stronger bargaining position than others?

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Topic : NATIONAL MINIMUM WAGE LAW

(June 2000/b)

Discuss whether a government should attempt to set a minimum wage. [10]

(June 1998/b)

Discuss how a national minimum wage might affect those on low wage. [10]

(June 1994/b)

Discuss the possible effect on equilibrium of the introduction of trade union wage bargaining. [10]

(June1993/b)

Use MRP theory to discuss the possible effects on wages and employment of the introduction of a national minimum wage in that industry. [15]

Topic : INDIVIDUAL'S SUPPLY OF LABOUR

June 2010/P42/Q4/a)

Analyse whether an increase in the wage rate always leads to an increase in the number of hours worked by an individual. [10]

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UNIT 12

Inequality and Policies to Redistribute Income

A2 Level
Microeconomics
Notes Book 3

Imran Latif
Cell: 0300-44-10-900
Imranlatifmalik@gmail.com

Syllabus 2017-19

a. Equity versus efficiency

- poverty trap analysis
- Gini coefficient
- Lorenz curve
- inter-generational equity
- Kuznets curve

b. Policies to redistribute income

- price stabilization
- means-tested benefits
- transfer payments
- progressive income taxes
- inheritance and capital taxes
- negative income tax

Unit 12 Inequality and Policies to Redistribute Income

Equity versus efficiency

Efficiency refers to how limited resources can be used in the best possible way. Equity means something that is fair or just. A “distribution” could be of income, poverty, government benefits, wealth, and so on. It is important to note that there is a difference between the terms “equal” and “fair.” A fair distribution of income, for example, is not the same as an equal distribution of income.
Equity has two sides to it. These are:

- **Horizontal equity**, whereby consumers and others with the same circumstances should pay the same level of taxation.
- **Vertical equity**, whereby taxes should be fairly apportioned between the rich and the poor in society.

Economic efficiency and equity are major objectives of microeconomic policy. But the policies that are used to promote efficiency may have the effect of increasing inequality. As a consequence, governments invariably find the trade-off between equity and efficiency necessary.

Intergenerational equity

A final issue to consider is that of **intergenerational equity** (the responsibility that the government has to provide a more equitable distribution of income and wealth in the future). This relates back to sustainability and the need for the present generation to take responsibility for the well-being of future generations. Wealth can be passed down from one generation to the next. Although taxes on wealth can marginally reduce inequality, it is important that current government policies work in such a way so as to not compromise the opportunities for a more equitable distribution in the future. This represents a substantial challenge for policy-makers.

Income and wealth

It is important to distinguish between income and wealth.
Income is a flow. It measures the receipt of money per period of time (e.g., £10 000 per year). It is the reward for the services of a factor of production. For labour, it is paid in wages and salaries; for land, it is rent; for capital, there is interest; and, for enterprise, there are profits.
Wealth is a stock. It measures the value of a person’s assets at a particular point in time. Assets may be in the form of property, shares, bonds, or bank accounts. Assets can provide an income stream for the future.

Measuring inequality

Inequality is one of the most contentious issues in the world of economics and politics. The most widely used methods for measuring inequality are the *Lorenz curve* and the *Gini coefficient*.

1. Lorenz curve

A curve indicating the cumulative percentage of income or wealth plotted against the cumulative percentage of the population (quintiles) to measure inequality in an economy.

- **Quintiles (fifths)** refer to the division of the total number of individuals, households, or families into five numerically equal groups.
- **Cumulative percentages** add a percentage of one period to the percentage of another period. In other words, it is the "running total" of some given data. For example:

Period	Given %	Cumulative %
1	10	10
2	20	10+20=30
3	40	10+20+40=70

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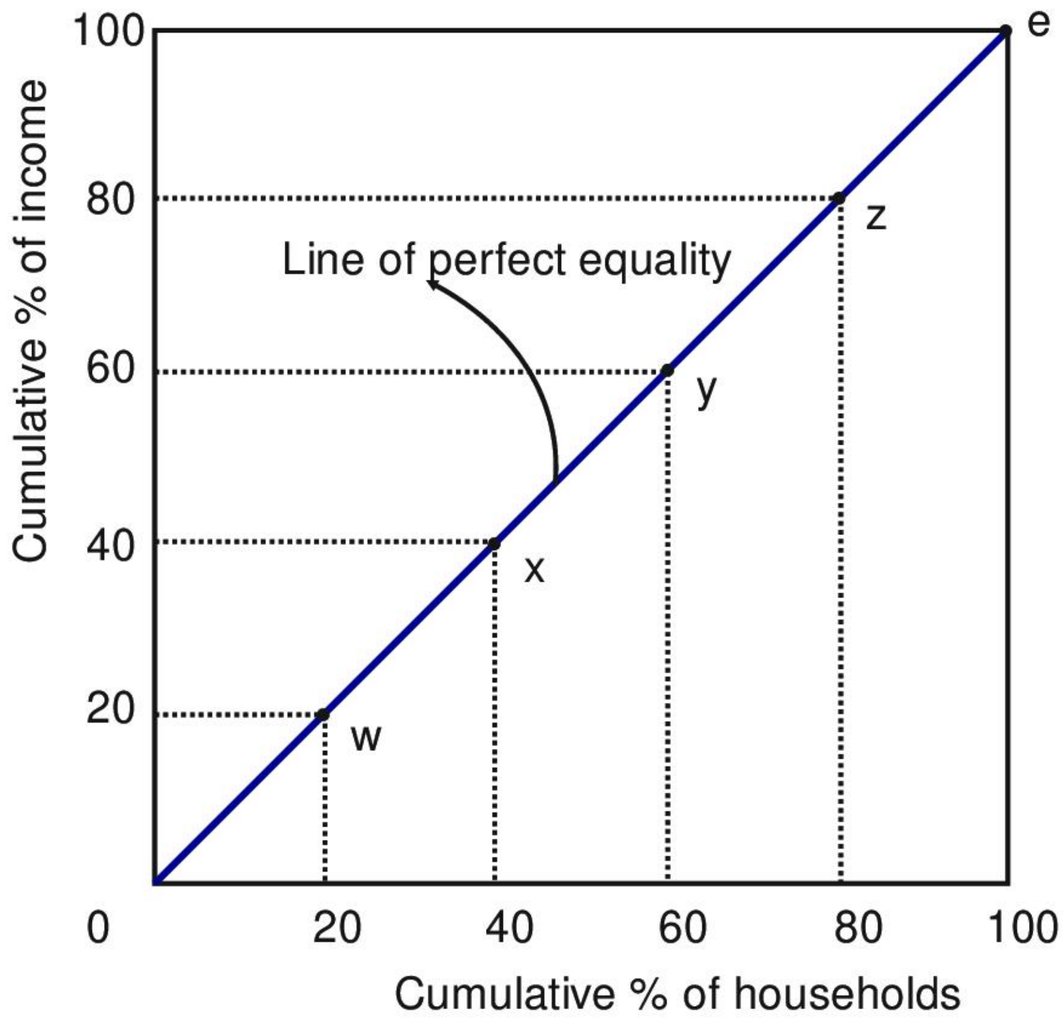
In the diagram below we plot the cumulative percentage of households on the horizontal axis and the percentage of income that they obtain on the vertical axis.



The diagonal line or 45^0 line (**the line of perfect equality**) 0*e* represents a perfectly equal distribution of income, because each point along that line indicates that a particular percentage of households receive the same percentage of income. These include point w (points representing 20 percent of all households receiving 20 percent of total income), point x (40 percent receiving 40 percent), point y (60 percent receiving 60 percent), and so on, all of which lie on the diagonal line.

Now, suppose there's a hypothetical economy with the following income distribution:

% of all households in the group (Quintile)	Income Share (%)	Cumulative Income Share (%)
Lowest 20 percent	4	**4**
Second 20 percent	9	4+9=**13**
Third 20 percent	15	4+9+15=**28**
Fourth 20 percent	23	4+9+15+23=**51**
Highest 20 percent	49	4+9+15+23+49=**100**

By plotting the quintile data from the table above we obtain the Lorenz curve as shown below.

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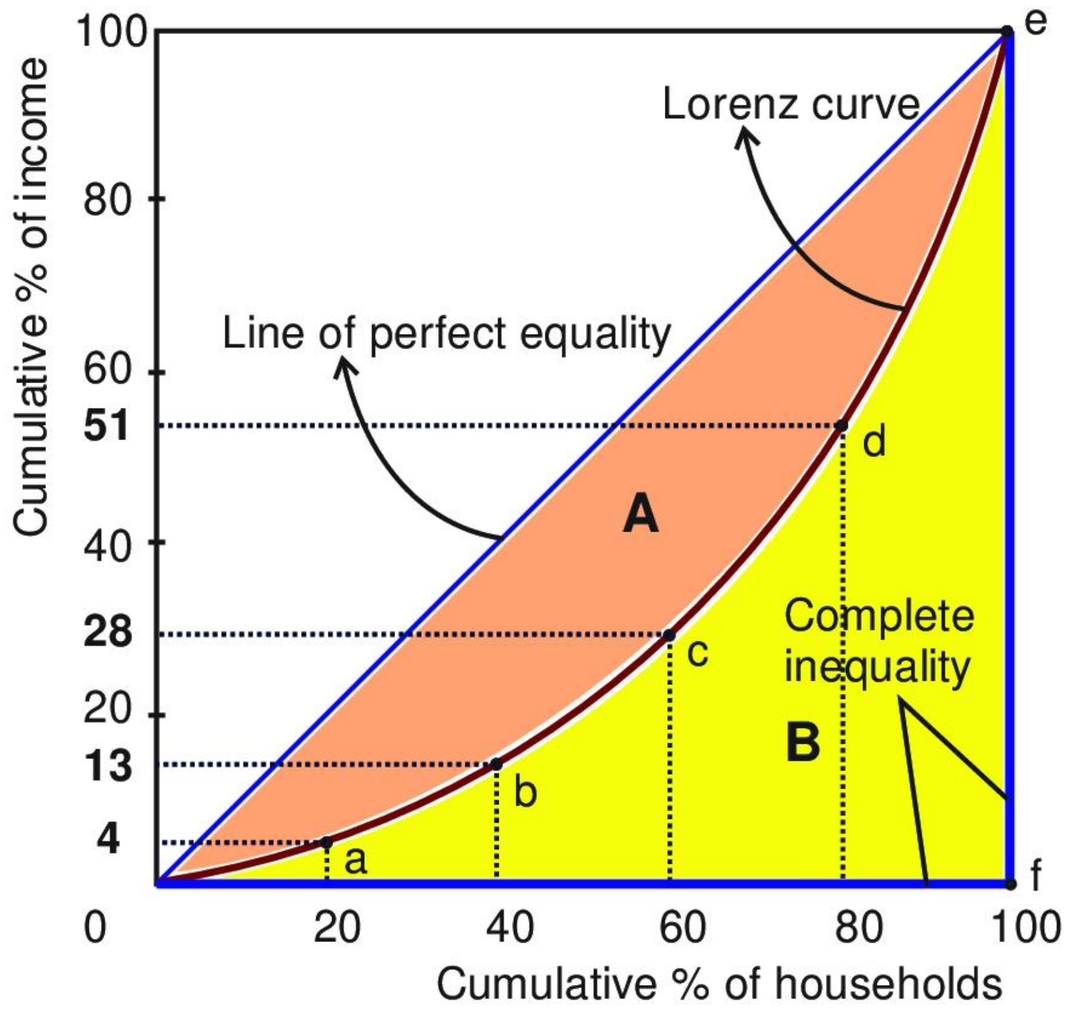

The bottom 20 percent of all households received 4 percent of the income, as shown by point ***a***; the bottom 40 percent received 13 percent (4+9), as shown by point ***b***; and so forth. The area between the 45^0 line (the line of perfect equality) and the Lorenz curve is determined by the extent that the Lorenz curve sags away from the diagonal and indicates the degree of income inequality as shown by area A.

If the actual income distribution were perfectly equal, the Lorenz curve and the 45^0 line would coincide and the area between them would disappear. At the opposite extreme is complete inequality, where all households but one have zero income. In that case the Lorenz curve would coincide with the horizontal axis from **0** to point ***f*** (at 0 percent of income) and then would move immediately up from ***f*** to point ***e*** along the vertical axis (indicating that a single household has 100 percent of the total income). The entire area below the diagonal line (A+B) would indicate this extreme degree of inequality. So the farther the Lorenz curve sags away from the 45^0 line, the greater is the degree of income inequality.

2. Gini coefficient

The income inequality described by the Lorenz curve can be transformed into a Gini coefficient—a numerical measure of the overall dispersion of income:

$$\text{Gini coefficient} = \frac{\text{Area between Lorenz curve and 45 degree line}}{\text{Total area below the 45 degree line}}$$

$$\text{Gini coefficient} = \frac{\text{Area A}}{\text{Area A} + \text{B}}$$

The Gini coefficient is the area between the Lorenz curve and the 45^0 line divided by the total area under the 45^0 line. As the area between the Lorenz curve and the diagonal gets larger, the Gini coefficient rises to reflect greater inequality. A lower Gini coefficient denotes less inequality; a higher coefficient indicates more inequality.

- A Gini coefficient of **zero** expresses perfect equality, where all values are the same (for example, where everyone has the same income).
- A Gini coefficient of **one** (or 100%) expresses maximal inequality among values (for example, where only one person has all the income or consumption, and all others have none).

Both extremes do not occur in reality—the norm is for coefficients to be somewhere between these two values. A Gini coefficient of 0.3 therefore indicates a more equal distribution of income than, say, a coefficient of 0.5. The smaller coefficient would be indicated by a slimmer segment on the Lorenz curve. The table below contains some typical examples.

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Country	Gini coefficient
South Africa	0.63
USA	0.40
India	0.33
Pakistan	0.30

Because Gini coefficients are numerical, they are easier to use than Lorenz curves for comparing the income distributions of different ethnic groups and countries.

Income Mobility: The Time Dimension

The income data used so far has a major limitation: The income accounting period of one year is too short to be very meaningful. Because the data portrays the distribution of income in only a single year, they may conceal a more equal distribution over a few years, a decade, or even a lifetime. If Brad earns $1000 in year 1 and $100,000 in year 2, while Jenny earns $100,000 in year 1 and only $1000 in year 2, do we have income inequality? The answer depends on the period of measurement. Annual data would reveal great income inequality, but there would be complete equality over the 2-year period. This point is important because evidence suggests a considerable “churning around” in the distribution of income over time. Such movement of individuals or house-holds from one income quintile to another over time is called **income mobility.** For most income receivers, income starts at a relatively low level during youth, reaches a peak during middle age, and then declines. It follows that if all people receive exactly the same stream of income over their lifetimes, considerable income inequality would still exist in any specific year because of age differences. In any single year, the young and the old would receive low incomes while the middle-aged receive high incomes. If we change from a “snapshot” view of income distribution in a single year to a “time exposure” portraying incomes over much longer periods, we find considerable movement of income receivers among income classes. The longer the time period considered, the more equal the distribution of income becomes.

Limitations of Gini coefficient

1. **The Gini coefficient is a relative measure:** Gini coefficients are simple, and this simplicity can lead to oversights and can confuse the comparison of different populations; for example, while both Bangladesh (per capita income of $1,693) and the Netherlands (per capita income of $42,183) had an income Gini index of 0.31 in 2010, the quality of life, economic opportunity and absolute income in these countries are very different—i.e., countries may have identical Gini coefficients, but differ greatly in wealth. Basic necessities may be available to all in a developed economy, while in an undeveloped economy with the same Gini coefficient, basic necessities may be unavailable to most or unequally available, due to lower absolute wealth.

2. **Different income distributions with the same Gini coefficient:** Even when the total income of a population is the same, in certain situations two countries with different income distributions can have the same Gini index. As an example, in a population where the lowest 50% of individuals have no income and the other 50% have equal income, the Gini coefficient is 0.5; whereas for another population where the lowest 75% of people have 25% of income and the top 25% have 75% of the income, the Gini index is also 0.5. Economies with similar incomes and Gini coefficients can have very different income distributions. Therefore, to rank income inequality between two different populations based on their Gini indices is sometimes not possible, or is misleading.

3. **The Gini coefficient ignores life-span changes in income**: Expanding on the importance of life-span measures, the Gini coefficient as a point-estimate of equality at a certain time, ignores life-span changes in income. Typically, increases in the proportion of young or old members of a society will drive apparent changes in equality, simply because people generally have lower incomes and wealth when they are young than when they are old. Because of this, factors such as age distribution within a population and mobility within income classes can create the appearance of inequality when none

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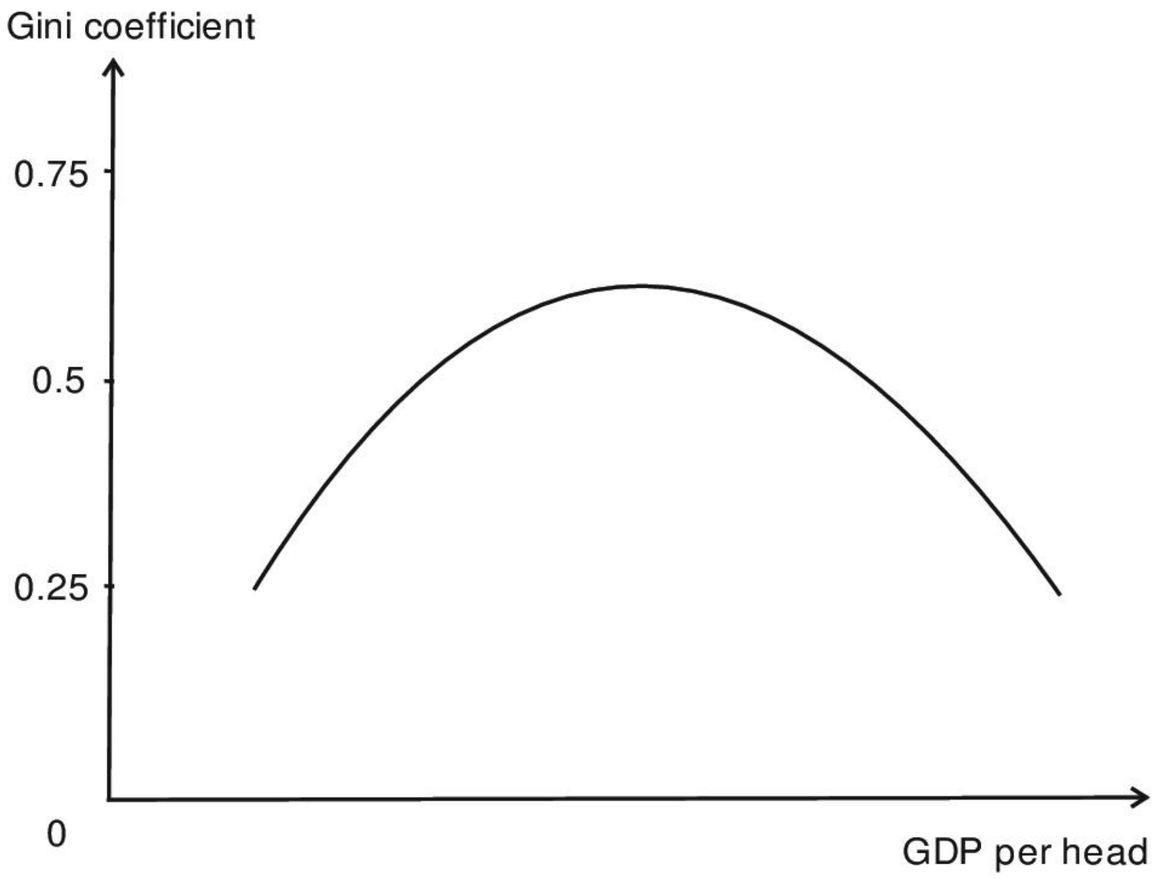
exist taking into account demographic effects. Thus, a given economy may have a higher Gini coefficient at any one point in time compared to another, while the Gini coefficient calculated over individuals' lifetime income is actually lower than the apparently more equal (at a given point in time) economy's. Essentially, what matters is not just inequality in any particular year, but the composition of the distribution over time.

3. Kuznets curve

Kuznets curve is a curve that shows the relationship between economic growth and income inequality.

This inverted U-shaped curve was first drawn by the American economist Simon Kuznets. The Kuznets curve suggests that as an economy develops, income becomes more unevenly distributed and then after a certain income level is reached, income becomes more evenly distributed as shown in Figure below.



The thinking behind this initial rise in income inequality is that as an economy develops there will be a movement of labour from low-paid and low-skilled agricultural jobs to higher paid and more skilled manufacturing jobs. This suggested trend, however, is not being followed in all developing economies. The curve also does not explain the rise in income inequality in some developed economies such as the UK.

Government policies to redistribute income and wealth

There are three main types of policies that are available to reduce inequality in the distribution of income and wealth. These are:

- through providing benefits (transfer payments)
- through the tax system
- through other policies.

1. Providing benefits (transfer payments)

Transfer payments are payments from tax revenue that are received by certain members of the community without any production activity. They are not made through the market, as no production takes place. The main recipients are vulnerable groups such as the elderly, the disabled, the unemployed, and the very poor. Payments tend to transfer income from those able to work and pay taxes to those unable to work or who are in need of assistance.

Examples include:

- old age pensions
- unemployment benefits, housing allowances, and food coupons
- child benefits.

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The extent to which transfer payments can be paid is heavily dependent on how much tax is collected and how many people have paid tax. In developing economies this is affected by all sorts of problems. Pakistan has a growing elderly population, yet it has a low tax base. Pension and social security coverage is limited to the formal sector and therefore only covers a small percentage of the population.

Advantages

- necessary to protect the most vulnerable groups in the community.
- less poverty.
- more equitable distribution of income.

Disadvantages

- acts as a disincentive to accepting work, thereby increasing the unemployment rate.
- output in the economy is less than it might be.
- Inefficiency.

There are two types of such benefits:

Means-tested benefits:

These are benefits paid only to those whose incomes fall below a certain level. They are targeted directly at those who are seen to be most in need. An example would be income support or unemployment benefits.

What is available varies between countries. Generally, more is likely to be provided in developed economies, since they have a more robust tax base to draw upon.

However:

- such benefits are not always claimed by those for whom they are designed.
- They can also create a disincentive to work.
- They create a **poverty trap** (where a person or family is financially worse off working rather than living off the range of benefits available). Such a situation can occur where there is a low income tax threshold and generous means-tested benefits up to a certain level of income.

Universal benefits:

The benefits that are available to all irrespective of income or wealth. These are paid out to everyone in certain categories, and are often age related, regardless of the recipients' income or wealth. Examples include universal state pensions and child benefits.

- Such benefits overcome the problems associated with means-tested benefits.
- However, they involve paying out money to many who do not need it and therefore tend to be expensive to operate.

2. Through the tax system

The tax system can be used in order to reduce inequalities in income and wealth. This is specifically through the use of progressive taxation. Progressive income taxes lead to those earning higher incomes being taxed a higher percentage of their income than those on lower incomes. In some economies the top rate of income tax might be as high as 80%, compared to rates in other economies of 40% and 20%. Thus, income differentials are reduced. Most **income tax** systems are like this example and are therefore progressive in nature. The average rate of tax rises as people earn higher incomes. The main problem, however, is that for some people, the result is a disincentive to work and possibly even to live in a high taxation regime.

Indirect taxes such as a general sales tax on products tend to be regressive. They have to be paid for by all who consume and so have no potential for redistributing income. Rich and poor people pay the taxes at the same rate.

Taxes can also be imposed to reduce wealth inequalities. One example is **inheritance tax**. Individuals who inherit more than a certain amount of wealth have to pay some of the value of that wealth in tax to the government. Another similar example is that of **capital gains tax**, whereby a tax is payable on the

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financial gain a person may have made in the time that an asset such as property or a financial portfolio has been owned. The overall impact of such measures remains modest.

3. Other policies

1. The government provision of certain services free of charge

A further way of reducing inequalities in society is for the government to provide certain important services free of charge to the user. Such services are financed through the tax system. If such services are used equally by all citizens, then those on the lowest incomes gain most as a percentage of their income. Inequality is thus lowered.

The two most significant examples of such free provision in many economies are **health care** and junior and secondary **education**. These markets are characterized by various market failures. However, these failures do not, according to standard economic theory, justify free provision to the consumer. The justification must be on the grounds of equity. The view is that everyone should have access to a certain level of health care and education regardless of income and wealth. Thus, these services are provided universally free: they are the material equivalent of monetary universal benefits.

2. Price stability

It can also be argued that **price stability** can assist in the redistribution of income. In such circumstances, the price level rises slowly and there is a steady rate of inflation. This provides relatively stable conditions for the macro economy. The income stream from taxation is secure; there is less pressure on government spending and there are likely to be more resources available to reduce income tax thresholds or the basic income tax rate. In a modest way, income inequalities may be reduced.

3. Negative income tax

Many economists have advocated supplementing the income of the poor using a **negative income tax.** According to this policy, every family would report its income to the government. High-income families would pay a tax based on their incomes. Low-income families would receive a subsidy. (In other words, they would “pay” a “negative tax.”)
If the tax paid on earnings is less than this annual benefit then the person receives the difference from the government; in other words, a negative income tax. Where the difference is positive, in the case of higher earners, then this is the amount of direct tax that has to be paid.
For example, suppose the government used the following formula to compute a family’s tax liability:

$$\text{Taxes owed} = (1/3 \text{ of income}) - \$10{,}000$$

Family Income	Income Tax
$90,000	(1/3 x 90,000)−10,000 = $20,000
$60,000	(1/3 x 60,000)−10,000 =$10,000
$30,000	(1/3 x 30,000)−10,000 =$0
$15,000	(1/3 x 15,000)−10,000 = −$5,000
$0	(1/3 x 0)−10,000 = −$10,000

In this case, a family that earned $60,000 would pay $10,000 in taxes, and a family that earned $90,000 would pay $20,000 in taxes. A family that earned $30,000 would owe nothing. And a family that earned $15,000 would “owe” −$5,000. In other words, the government would send this family a cheque for $5,000.
Under a negative income tax, poor families would receive financial assistance without having to demonstrate need. The only qualification required to receive assistance would be a low income. Depending on one’s point of view, this feature can be either an advantage or a disadvantage. Some may think that a negative income tax would subsidize those who are simply lazy and, in some people’s eyes, are undeserving of government support.

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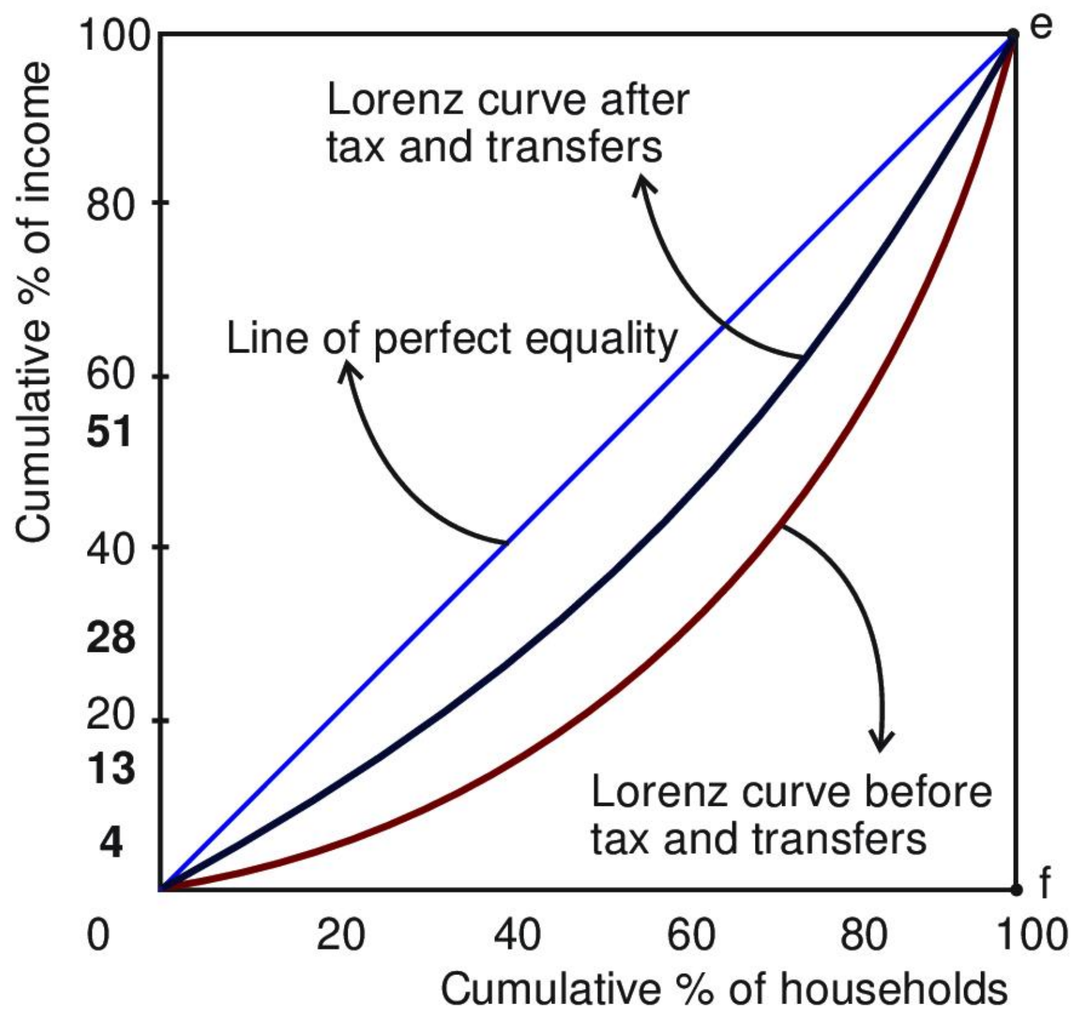
Effect of government redistribution on the Lorenz curve and Gini coefficient

The distribution of household income is significantly more equal after taxes and transfers are taken into account than before. Transfers (providing benefits) account for most of the lessening of inequality and provide most of the income received by the lowest quintile of households. Government income and wealth redistribution policies shift the Lorenz curve and bring it closer to the 45^0 line and reduce the value of the Gini coefficient, as shown in the diagram below.



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